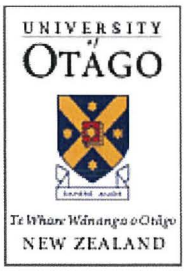

AN INTEGRATIVE LITERATURE REVIEW OF NURSE-LED INTERVENTIONS FOR THE PREVENTION AND MANAGEMENT OF CARDIOVASCULAR DISEASE

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ABSTRACT

Background

Cardiovascular disease is the leading cause of death and premature mortality and is estimated to cause 40% of all deaths and 33 percent of life years lost between 45 and 64 years of age in New Zealand (New Zealand Guidelines Group, 2003). New advanced nursing models have developed in response to changing healthcare demands, strategic development and technological advances. The literature suggests that nurse-led management of cardiovascular disease leads to improved outcomes for patients, with the emphasis on the adoption of a healthy lifestyle and the optimisation of the management of modifiable risk factors.

Objective

The aim of this integrative literature review is to analyse the characteristics of nurse-led interventions for the prevention and management of cardiovascular disease. This review considers the nurse as the intervention provider, and examines the reported effectiveness of differing forms of successful management strategies.

Research Methodology

This integrative review considers studies that met the inclusion criteria, including interventional and non-interventional research designs. The Joanna Briggs Institute format for literature reviews is utilised, integrating other methods for appraisal and synthesis, allowing the systematic gathering of report themes. Thematic analysis of the emerging themes describes the factors that support or impede the development of the nurse-led clinic, assessing and describing the characteristics of the successful clinic.

Results

Seventeen studies met the inclusion criteria and these were included in this integrative review. The initial appraisal resulted in a narrative summary of the included studies, the extracted themes relating to the research questions, and provided the sub-headings within the study reports. The data extrapolated from individual sources underwent further synthesis, developing important and accurate themes in order to answer the research questions. The review findings describe the intrinsic factors that surround the preparation and support of the nurse, as well as nursing management of cardiovascular disease relating these to the current New Zealand primary health environment.

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ABBREVIATIONS

BMI .....Body Mass Index

BP .....Blood pressure

CGG.....Clinical Governance Group

CHD.....Coronary heart disease

DHB.....District Health Boards

JBI .....Joanna Briggs Institute

MoH.....Ministry of Health

NCNZ .....Nursing Council of New Zealand

NP .....Nurse Practitioner

NZ.....New Zealand

NZGG.....New Zealand Guidelines Group

PHO .....Primary Health Organization

RN .....Registered Nurse

SF-36 .....Short form 36

DEFINITIONS

For the purpose of this literature review, the following definitions have been used:

Cardiovascular Disease is defined as angina, myocardial infarction, ischaemic stroke, transient ischaemic attack and peripheral vascular disease (NZGG, 2003).

Collaboration and colleagueship are defined as having 'a concern for mutual goals, equality in status, prestige, and access to information' and 'diversity in expertise, skills, knowledge and practice' (MoH, 2002).

Mentoring may be acknowledged as a developed and personalised form of professional support, the writer preferring a broad approach to the term as described by the following authors. Murray states, as cited in Jarvis and Gibson (1997), that there are two schools of thought about mentoring: one suggesting that it can be structured or facilitated, while the other maintains it can only happen when the chemistry is right between two people. In order for a successful mentoring relationship to develop, respect, chemistry and trust are required for an environment conducive of learning and reflection. Mentoring may be considered to fulfil both psychosocial and career functions by sponsoring, coaching, protecting a protégé, acting as a role model, providing acceptance and friendship (Firtko, Stewart & Knox, 2005).

Nurse-led clinics are a structured and formalised healthcare delivery mode involving a nurse and a client with health-care needs that can be addressed by a nurse. Nurses working in these clinics demonstrate advanced competence to practise in a specific health care area, and

function either independently (and/or interdependently with other members of the multidisciplinary team) in case managing clients (adapted from Wong & Chung, 2005).

Nurse Practitioner as defined by Nursing Council of New Zealand (2009, p.36):

> Nurse Practitioners are expert nurses who work within a specific area of practice incorporating advanced knowledge and skills. They practise both independently and in collaboration with other health care professionals to promote health, prevent disease and to diagnose, assess and manage people's health needs. They provide a wide range of assessment and treatment interventions, including differential diagnoses, ordering, conducting and interpreting diagnostic and laboratory tests and administering therapies for the management of potential or actual health needs. They work in partnership with individuals, families, whanau and communities across a range of settings. Nurse practitioners may choose to prescribe medicines within their specific area of practice. Nurse practitioners also demonstrate leadership as consultants, educators, managers and researchers and actively participate in professional activities, and in local and national policy development. They practice both independently and in collaboration with other health care professionals to promote health, prevent disease and to diagnose, assess and manage people's health needs.

Preceptorship is defined as a role undertaken by an experienced nurse to guide and educate a less experienced nurse (Firtko, Stewart & Knox, 2005). The role is clinically orientated, is task based and is used in the orientation of a new nurse to a clinical setting, and facilitates a supported learning environment, provides a strong role model and encourages self-reflective

learning and problem-solving skills. It is well understood that effective preceptorship is integral to the promotion of critical thinking (Myrick & Yonge, 2002), an indication of advanced nursing practice.

Registered Nurse as defined by Nursing Council New Zealand (2009, p.10):

> Registered nurses utilize nursing knowledge and complex nursing judgment to assess health needs and provide care, and to advise and support people to manage their health. They practice independently and in collaboration with other health professionals, perform general nursing functions and delegate to and direct enrolled nurses and nurse assistants. They provide comprehensive nursing assessments to develop, implement, and evaluate an integrated plan of health care, and provide nursing interventions that require substantial scientific and professional knowledge and skills. This occurs in a range of settings in partnership with individuals, families, whanau and communities. Registered nurses may practice in a variety of clinical contexts depending on their educational preparation and practice experience. Registered nurses may also use this expertise to manage, teach, evaluate and research nursing practice. There will be conditions placed on the scope of practice of some registered nurses according to their qualifications or experience limiting them to a specific area of practice.

Short Form 36 (SF-36) is a short form health survey with 36 items measuring the following eight domains of health: physical functioning, role limitation caused by physical health problems, bodily pain, general health, energy and vitality, social functioning, mental health and role limitations, and limitations caused by mental health problems.

CHAPTER 1:

INTRODUCTION TO THE DISSERTATION

1.1 Introduction

The objective of this dissertation is to critique the literature surrounding the nurse-led management of cardiovascular disease. The review will follow an integrative review methodology, considering the nurse as the intervention provider and examining the factors that determine the effectiveness of nurse-delivered interventions in the primary care and outpatient setting. By way of introduction, this section describes the development of public health policies in response to the prevalence of cardiovascular disease as demonstrated both nationally and internationally. It describes the ethnic disparity as seen in the New Zealand context and describes how policies are driving a way forward to better manage these inequalities in care. The author has set the scene by describing her work environment and current developments within the Southland PHO environment.

Healthy lifestyle interventions and the optimisation of the management of modifiable risk factors contribute significantly to the reduction of cardiovascular morbidity and mortality (New Zealand Guidelines Group, 2003). Cardiovascular disease is the leading cause of death and premature mortality in New Zealand, accounting for 40% of all deaths and for 33% of life years lost between forty five and sixty four years of age (NZGG, 2003). In other western

countries, statistics are similar, with cardiovascular disease the leading cause of death in the United States of America (Jilcott et al., 2006) and the United Kingdom (Wood et al., 1994).

New models of care in the management of chronic disease include nurse-led clinics which have shown to be effective in preventing secondary cardiovascular outcomes (Fahey & Schroeder, 2004). The literature suggests that nurse-led management of cardiovascular disease leads to improved outcomes for patients. With the projected increase of coronary heart disease due to an aging population (Joanna Briggs Institute, 2006) nurses can provide an emphasis on health promotion, effectively managing the primary and secondary prevention of cardiovascular disease.

1.2 Development of New Zealand health policy

Within the last decade, the Ministry of Health (MoH) has published several documents that have impacted on the provision of health care. *The New Zealand Health Strategy* (MoH, 2000) and the *New Zealand Disability Strategy* (MoH, 2001) are considered to provide the framework for the development of the ensuing strategies, public health policies, funding models and action plans within the health sector. *The Primary Health Care Strategy* (MoH, 2001) was developed with the recognition that an empowered primary health care system is required to improve health of New Zealanders and reduce health inequalities and recognised disparities. These documents provided the foundation for the provision of care that the more recently structured Primary Health Care Organizations (PHO) were mandated to provide for their enrolled population. The strategies highlighted priority areas, focusing on diseases and factors that influence the population's health, and created a vision for a society that valued all New Zealanders equally.

A change of New Zealand government in 2008 has brought with it a new strategic direction in health, as described in the document *Statement of Intent* (MoH, 2009) published in May 2009, and the more recent report of the Ministerial Review Group (2009) released August 2009. The statement of "better, sooner, more convenient" services (MoH, 2009, p.2) is the intent of the Ministry in developing a more innovative, responsive and affordable health and disability service. Two of the six identified health targets are directly aligned with cardiovascular disease management, and are aimed at improving diabetes, cardiovascular services and smoking cessation. Ensuring that the health workforce meets increasing demand, along with a rationalisation of expenditure and increasing clinical leadership are three of several identified goals. Through this statement, the Ministry has identified several gaps in current service provision. It is therefore imperative that support is provided for the ongoing development of nursing in order to meet the pre-defined targets as described in this statement of intent, and this concept will be re-visited later in the dissertation.

1.3 Health strategy in New Zealand

As previously described, the Ministry has recently initiated change in strategic direction, in order to provide a more responsive health and disability service in the current economic and social environment. However, it is important to review the prior defining strategies, which have provided a framework for the development of the current health approach, recognising the ongoing impact they have on health care within New Zealand.

In 2000, the Ministry of Health published the *New Zealand Health Strategy* (MoH, 2000) to provide a framework by which District Health Boards and other organizations were to operate. The Ministry identified ten goals for population health. The goals and objectives were structured to reflect the wide range of factors that affect health. The framework

addressed society-wide issues, such as employment and income status along with the environment in which people live and the potential for effecting health improvement within context. Consideration was given to the effects of lifestyle issues, specific diseases, and the accessibility of health services.

Three of the identified goals relate directly to reducing the incidence and impact of cardiovascular disease, which was one objective (MoH, 2000). However, other objectives linked directly to cardiovascular disease, including improving nutrition, reducing obesity, reducing smoking, reducing the incidence and impact of diabetes, and increasing the level of exercise. Providing easily accessible and appropriate primary health care was considered necessary in order to remove barriers to the provision of health services throughout the lifespan, either urban or rural based, or in the primary or secondary care environment (MoH, 2000). With a clear goal to implement the objectives, an independent expert advisory group was formed to assist the MoH to review the evidence and produce a Cardiovascular Action Plan aimed at addressing the cardiovascular areas that would have greatest population impact, and included as one of the directives, cardiovascular risk screening and management (New Zealand Guidelines Group, 2003).

In 2003, the MoH funded the independently managed New Zealand Guidelines Group (NZGG) to produce the evidence-based guidelines *Assessment and Management of Cardiovascular Risk* (update released 2009) to be principally used in primary health care, for the effective assessment and management of cardiovascular disease and the modifiable risk factors (Appendix 1). The guidelines strongly support the population health approach that uses intersectoral action to address socio-economic, ethnic, sex and geographic inequalities, relying on practitioners in primary health to identify the barriers for those that are disadvantaged and at risk (NZGG, 2003; NZGG, 2009). A more recent development made

accessible to primary health care, and aligning with the development of the guidelines, has been the development of electronic decision support modules (ECDS). Two examples of these tools includes Predict™ and bestpractice™, available for use widely in general practices in New Zealand. Accessibility and adoption of the ECDS within practice environments is dependent on practice infrastructure, including practice management systems (PMS), and requires provider support.

In the *Primary Health Care Strategy* (MoH, 2001), the Honourable Annette King acknowledged that most of the "principles, goals and objectives in the New Zealand Health Strategy will only be achieved through a strong primary health care system" (MOH, 2001, p. iii). The Primary Health Care Strategy links the necessary development of advancing nursing practice to the provision of health care within the New Zealand primary health care environment.

> The move towards greater population focus and emphasis on a wider range of services will increase the need for well-trained primary health care nurses. Such nurses will share a common set of generalist knowledge and skills as well as developing advanced skills in particular areas of professional practice. The concept of the primary health care nurse needs further development with clarification of the appropriate capabilities, responsibilities, areas of practice, educational and career frameworks and suitable employment arrangements. Primary health care nursing will be crucial to the implementation of the Strategy, and will therefore be best addressed at the national level.
>
> (MoH, 2001, p. 22)

In order for this development, it was acknowledged that the nursing workforce required strengthening and developing to assist in chronic disease management, and in 2001, an expert advisory group was set up to report back to the Ministry of Health on the development of primary health care nursing in New Zealand. *Investing in Health: Whakatohutia te Oranga Tangata* (MoH, 2002) was the output of the Advisory Group, which provided a "national framework for primary health care nursing in New Zealand" (p. vii).

At a similar time, the Ministry of Health was recognising the opportunities for health gain with the development of the Nurse Practitioner (NP) scope of practice and the publishing of *Nurse Practitioners in New Zealand* (MoH, 2002). It was acknowledged that the NP had an advanced level of skills that provided a responsive model of patient care (MoH, 2002), the document described how the NP would assist the District Health Boards to provide new and innovative models of care that would improve the health status of their local community, in collaboration with other health care professionals. The NP role was envisaged to have considerable impact on the provision of healthcare and the management of chronic disease. However, to date, there are only 55 registered NP's in NZ, with 18 working within the primary health care sector.

1.4 Development of nursing in response to evolving policy

In the context of these policy developments there have been significant advancements occurring within nursing, especially seen in the management of chronic disease and working with the vulnerable sections of society (MoH, 2009). The MoH (2005) recognises that new nursing models are being created and boundaries between disciplines are shifting in response to government policy, changing healthcare demands and technological advances. Nursing models that support advancing practice are being developed in the belief that the nursing

profession has the structures in place for increased autonomy, professional recognition and accountability (Docherty, Sheridan & Kenealy, 2008). It is crucial that models for advanced practice should be nurse-defined and nurse-led, as has been the case with the development of the NP role in New Zealand.

Although policies have opened the way for nurses to step forward and develop extended and innovative new roles, it is recognised that there are facilitators and barriers that support or impede this happening. These barriers include education, funding streams, management, leadership and mentoring, recruitment and retention (MoH, 2009). Despite the recognition that primary health care nursing is integral to the success of the *New Zealand Health Strategy* (MoH, 2000), Docherty et al. (2008) describe an ongoing environment of employment and funding that fails to support the development of primary care nursing, along with insufficient numbers of nurses in strategic positions to influence developing health care policy.

As described, it is well recognised that innovative nursing models are integral to the success of the *New Zealand Health Strategy* (MoH, 2000). Therefore, as a collective profession, it is essential that nurses be accountable for reducing barriers by facilitating an increased involvement in the strategic and managerial aspects of health care delivery. It is fundamental that nurses take responsibility for their profession by defining their own practice and its boundaries to provide responsive care to their communities.

1.5 Ethnic disparity and strategy development

A major concern expressed in the *New Zealand Health Strategy* (MoH, 2000) was the significant inequalities in health that existed among different groups of New Zealanders. It is widely understood that there are several determinants of health, with the socially deprived

experiencing poorer health, greater exposure to health risks and reduced access to health care (MoH, 2002). Recognising these significant inequalities prompted the Ministry of Health and its advisors to undertake a co-ordinated and structured approach with the development of the *He Korowai Oranga: The Maori Health Strategy* (MoH, 2002). The overarching themes of the *Maori Health Strategy* (2002) guided the writing of *Whakatataka* (the Maori health action plan 2002-2005), and *Reducing inequalities in Health* (MOH, 2002). These strategies and guidelines evolved within the framework of the Treaty of Waitangi principles of partnership, participation and protection.

> **Partnership** is the working together between the iwi, whanau and Maori communities with the representatives of the Crown to develop appropriate health services. It involves commitment to ongoing dialogue through the planning and provision of care.
>
> **Participation** is the involvement and sharing of Maori at all levels of the planning, development and provision of health care. It involves the consultation of Maori at all levels.
>
> **Protection** is ensuring that Maori receive the same amount of health care as non-Maori. It is acknowledged that Maori have the right to respect and that their cultural differences are acknowledged and incorporated into provision of care.
>
> (MoH, 2002, p.2).

The Treaty of Waitangi, generally considered the original document of New Zealand, was signed in 1840 and consented to the settlement of New Zealand by non-Maori. The obligations of the Crown are recognised to be central to the development of a framework that proposes to reduce these inequalities through recognising the rights and responsibilities and

relationship between Maori and the Crown. Sadly, the reality of the cardiovascular health status of Maori in New Zealand does not reflect these ideals. The NZGG (2003) support a population health focus that addresses and eliminates Maori inequalities, this requiring innovative models of care and support that target lifestyle interventions and risk factor reduction.

1.6 Cardiovascular disease among Maori

In New Zealand, the burden of cardiovascular disease falls heavily on Maori, and although death rates for coronary heart disease have fallen for both Maori and non-Maori, the reductions have been considerably less for Maori and as a result disparities in cardiovascular disease have widened over the last two decades (Bramley et al., 2004; NZGG, 2003). Not only do Maori have a higher incidence of cardiovascular disease and 30-day age standardised case fatality rates following acute coronary syndrome, but as might be predicted, they also have the highest prevalence of many of the modifiable risk factors. Smoking is considered the leading modifiable risk factor (Bramley et al., 2004) with 44% of Maori males (compared with 24% European males) and 51% of Maori females (compared with 24% European females) smokers (Bramley et al., 2004). Similar statistics occur in self-reported hypertension and obesity. This evidence of ethnic disparity is also seen internationally with widening gaps occurring among various ethnic minorities (Andrews, Felton, Wewers, Waller & Tingen, 2007; Bellary et al., 2008). As the incidence of cardiovascular events is elevated in Maori, it would be expected that the utilisation of cardiovascular interventions would also be higher in this group, but the opposite is true with the mean age standardised CABG (coronary artery bypass grafting) and PTCA (percutaneous transluminal coronary angioplasty) intervention rate of 0.40 and 0.29 respectively, when compared to European men (Bramley et al., 2004). It is also notable that high-risk Maori group of diabetics were not receiving regular follow-up

and were more likely therefore not to be taking the recommended medication for glycaemia and lipid control, recognised important determinants of cardiovascular disease (Bramley et al., 2004).

In addition to the higher rate of death post acute coronary syndrome, the overall death rates from coronary heart disease for Maori and Pacific males are almost twice as high as others (Hay, 2004). Age-specific coronary heart disease death rates are two to three times higher compared to non-Maori in those aged less than 75 years. These statistics are mirrored through the cardiovascular disease spectrum. Maori and those from a lower socio-economic group receive disproportionately less intervention than non-Maori (NZGG, 2003).

Cardiovascular care in New Zealand demonstrates the inverse care law- that is, those that are most in need receive the least care (NZGG, 2003). This disparity in healthcare is considered "unjust and inequitable, avoidable, and potentially detrimental to all members of society" (Bramley et al., 2004, p. 1). By recognising the Treaty of Waitangi and the rights as tangata whenua, it is essential these disparities be rectified.

1.7 Local solutions: Implementing health strategy in Southland

Solutions that are developed locally respond to a demonstrated need of a specific population and work force (MoH, 2000). In 2004, Southland District Health Board developed *A Strategy for tackling Cardiovascular Disease in Southland*, in partnership with key stakeholders and as a response to the *New Zealand Health Strategy* (MoH, 2000). The Southland document provided a strong framework for the reduction of incidence and impact of cardiovascular disease and articulated that the long-term approach needed to target high-risk individuals through a population based strategy. The implementation of this strategy has occurred

recently with the four Southland PHO's currently funding a programme to assist primary health care providers to identify those at risk of developing cardiovascular disease through a screening initiative. With the strategic guidance of the Southland PHO's Clinical Governance Group (CGG), mobilised funding streams, nursing leadership and educators, general practices within Southland are presently rolling out this new initiative to meet the pre-defined CGG objectives.

Southland primary health care nurses will realize the benefits of a further initiative that has occurred in Southland, with the development and implementation of the *Southland Primary Health Care Nursing Strategic Plan* (2008) the author suggests an environment is evolving where collaboration is evidenced inter-professionally and across health care sectors. Furthermore this environment is supported by the collective management structure of PHO Management Services Southland Ltd (2008). The PHO management structure has provided the framework for the development of nursing leadership and vision that is responsive to the growing needs of the community, is mobilising the nursing workforce in Southland, and is working towards breaking down the dismal reality of primary care nursing, as described by Docherty, Sheridan & Kenealy, (2008). They describe an aging nursing workforce with no clear career pathway, and management and funding barriers that do not support nursing, a recognised intent of the Strategy.

In my role as a Practice Nurse in Tuatapere, an isolated rural practice in Western Southland, I am aware of the impact of cardiovascular disease on our population. A demographic profile taken from Primary Health Organisation (PHO) statistics on the 01/07/2009 data show that the Tuatapere Medical Centre has an enrolled population of 1756, with 16 % enrolled as Maori or Pacific Island descent, and 14% of the population 65 years and over. I am conscious of the health needs of our practice population and the isolated rural community as an entirety, and

this has been a compelling factor in the development of my advanced clinical pathway and the cardiovascular risk assessment and management programme within this practice setting. Based on the identified goals of the *New Zealand Health Strategy* (MoH, 2000), the *Primary Health Care Strategy* (MoH, 2002) and the clinical protocols from the New Zealand Guidelines Group (2003; 2009), I initiated a cardiovascular risk assessment programme. Three years later it is appropriate to seek a greater understanding through reviewing the literature surrounding the nurse-led management of cardiovascular disease in the primary health care setting.

1.8 Structure of the dissertation

In the next chapter the author will present the question and the method by which the dissertation explores the literature on nurse-led management of cardiovascular disease. Chapter Two describes the literature review method and the aims of the review, narrating the process of analysis, synthesis and literature integration that develops in the following chapters.

Chapter Three describes the included research reports that meet the inclusion criteria, as defined in the previous chapter. Each of the seventeen studies is narrated, including research aims, methodology utilised, outcomes, and discussing methodological flaws. Initial appraisal occurs with extraction and description of broad themes relevant to each included research study.

Chapter Four synthesises the themes extracted in the previous chapter. Through applying the model described in Chapter Two, the integration and synthesis of the initial themes has led to further thematic development and conceptualisation. The recurrent themes found within the literature are represented by the headings within this chapter.

Chapter Five summarises the findings from the integrative review, discussing the implications of the results on the provision of nurse-led cardiovascular disease management, providing suggestions for local solutions. The chapter provides recommendations that support the review conclusions, and suggests the implications for further research that would contribute to the research body of evidence.

CHAPTER 2:

REVIEW METHODS

2.1 Introduction

The aim of the following integrative literature review is to explore the characteristics of nurse-led interventions for the prevention and management of cardiovascular disease. As described in Chapter One, there are several social and political factors that impact on the provision of nurse-led cardiovascular disease management. Greater understanding and identification of the issues surrounding what drives and impedes these initiatives is sought.

This review will consider the nurse as the intervention provider (*intervention nurses*[1]) and will examine the effectiveness of differing forms of management strategies. Therefore, this integrative review analyses the themes emerging from the literature surrounding nurse-led management of cardiovascular disease and provide recommendations for future practice development.

An integrative literature review using thematic analysis has been chosen to discuss current research on this topic and provide recommendations for moving forward. The review includes experimental and non-experimental research literature. The section on research methodology describes the process taken to search, manage, review and synthesise the retrieved literature.

[1] '*Intervention nurses*' is a nominated term that will be utilised within this review to identify the nurses involved in the nurse-led management of cardiovascular disease.

The author has deployed the concept of methodological quality and evidential hierarchies when critiquing the research literature.

2.2 Review objectives

The objective of this review is to present the best available evidence surrounding the following research questions:

- What are the characteristics of successful nurse-led management of cardiovascular risk factors in both asymptomatic and symptomatic patients in the primary health/outpatient setting?
- What are the factors that support and/or impede the development of a successful nurse-led initiative in the management of cardiovascular disease?

2.3 Review method

Integrative reviews provide a broad summary review of the literature and have been described as encompassing both empirical and theoretical literature, addressing multiple methodological perspectives (Webb & Roe, 2007). An integrative literature review has been chosen to discuss current knowledge and issues surrounding nurse-led management of cardiovascular patients, outlining gaps in that knowledge and identifying strategies of management (Bryant et al., 2003). Through integrating evidence-based recommendations with clinical expertise and existing resources (Polit & Beck, 2004), this review will discuss recommendations for the nurse-led management of cardiovascular disease in the New Zealand primary care setting. The sampling frame includes quantitative and qualitative research involving various methods (Webb & Roe, 2007).

The methodological quality of individual studies is discussed in Chapter Three. The use of evidential hierarchies ranks the strength of evidence and assures theoretical rigour and reduces bias in the analytic process. The level of evidence found ranged from Level I (highest level) through to Level VI on the Evidence Based Practice (EBP) rating scale as described in Polit and Beck, 2004.

Table 1 – Evidence Hierarchies

Evidence Hierarchies	
I	Meta-analysis of controlled studies
II	Individual experimental studies
III	Quasi-experimental studies (e.g., time series, non-equivalent control group) or matched case-control studies
IV	Non-experimental studies (e.g., correlational, descriptive, qualitative studies)
V	Programme evaluations, research utilization studies, quality improvement projects, case reports
VI	Opinions of respected authorities and of expert committees

(Polit & Beck, 2004)

Utilising the Joanna Briggs Institute format for literature reviews, and integrating other methods for appraisal and synthesis, a systematic gathering of report themes, strengths and limitations has occurred. The initial stages of data extraction utilised the literature review protocol, as shown in Appendix 2. These initial findings were appraised and then reported on in Chapter Three before the further synthesis that is presented in Chapter Four. The following data analysis tool shows differing strategies that were applied during the stage of data analysis. Utilising this analysis tool assisted with the identification of important and accurate themes, patterns or relationships between the included studies (Whittemore & Knafl, 2005).

Table 2 – Elements of Data Analysis

Elements of Data Analysis
Noting patterns and themes
Seeing plausibility
Clustering
Counting
Making contrasts and comparisons
Discerning common and unusual patterns
Subsuming particulars into general
Noting relations between variability
Finding intervening factors
Building a logical chain of evidence

(Whittemore & Knafl, 2005)

The final phase of the review is the drawing out of the research conclusions, evolving the described patterns and themes to a broader process of abstraction and generalisation, generating practice recommendations for the nurse-led management of cardiovascular disease. The process utilised in this literature review is conceptualised and depicted in the following diagram.

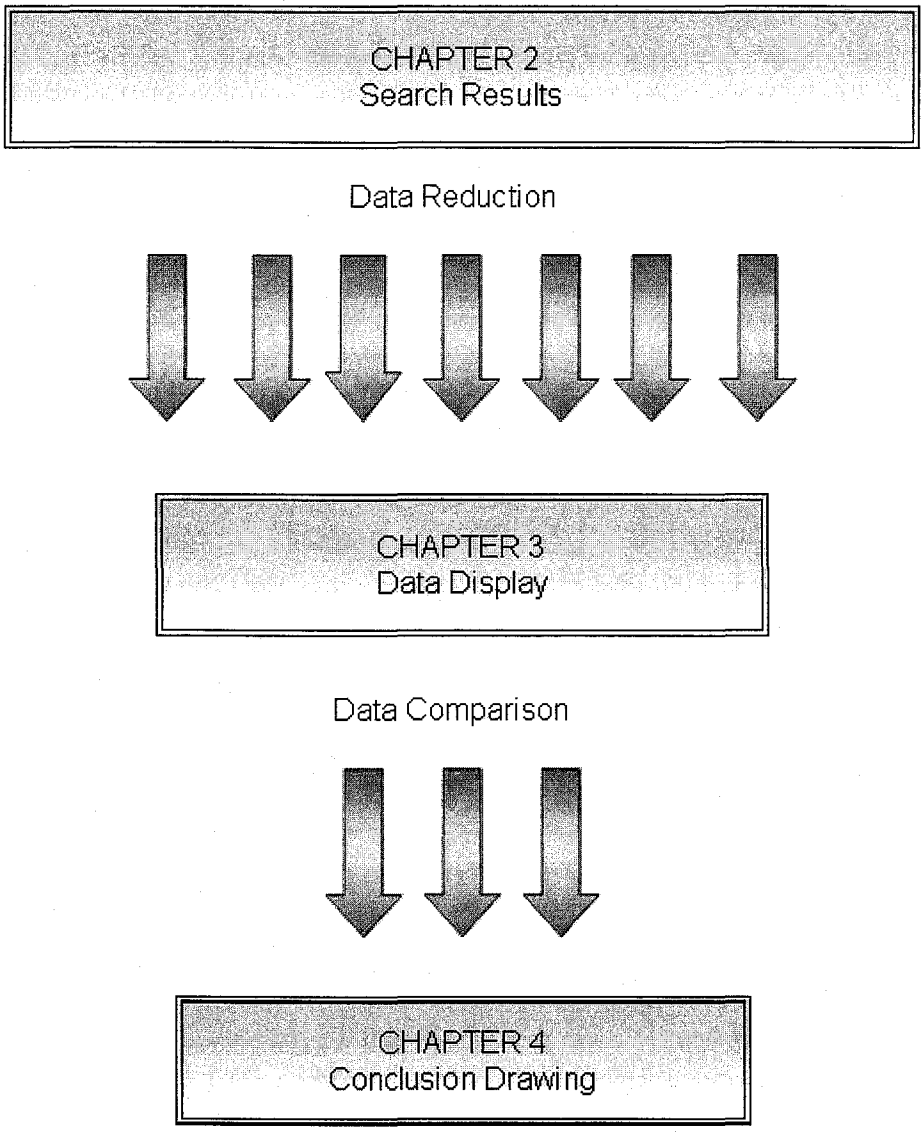
2.4 Inclusion criteria

Inclusion criteria for this literature review:

- nurse-led initiatives in primary or outpatient clinic setting;
- nursing intervention/follow-up ≥ 6 months;
- adults ≥ 18 years;
- assessment and/or management of cardiovascular risk factors ;
- literature source dated post 1990;
- English language.

These criteria were considered intrinsic to the development of the research objectives. Research literature that did not meet these criteria was excluded from the review.

Table 3 - Integrative Review Methodology



2.5 Types of outcome measures

The primary outcomes of interest were selected due to their association with the development of cardiovascular disease, and are the outcome measures utilised when considering the efficacy of nurse-led initiatives. They include:

- Blood pressure (BP);
- Lipid results;
- Weight/ BMI;
- Smoking status;
- Diabetes control (HbA1c);
- Cost-effectiveness;
- Framingham Risk Equation;
- Medication- compliance and prescribing;
- Lifestyle factors;
- Quality of Life/ Health status questionnaires;
- Consumer satisfaction.

2.6 Types of studies included

This integrative review considered all studies that met the inclusion criteria, including interventional and non-interventional research designs. Quantitative research provides data that is strong in generalization and precision, with the findings based on empirical evidence (Polit & Beck, 2004). Some of the included studies utilised mixed methods, the qualitative research in the included studies was used to assess health professional and patient attitudes to cardiovascular health promotion, opinions of efficacy, perceptions of skills, and to identify perceived barriers to nurse-led care (Steptoe, Doherty, Kendrick, Rink & Hilton, 1999; Murchie, Campbell, Ritchie & Thain, 2005; Brown, Shewan, McDonnell & Davies, 1999). Integrating qualitative data into the review broadens the review base and leads to a more robust evaluation of healthcare issues, increasing understanding of the factors that influence the outcomes, and helps to develop recommendations for practice (Webb & Roe, 2007).

2.7 Search strategy

A bibliographic search was conducted using several databases. Access was gained to electronic article databases through the University of Otago remote library, and included CINAHL (Cumulative Information for Nursing and Allied Health Literature) (1982 to September Week1 2008), Ovid MEDLINE (1950 to Present with Daily Update) and Ovid Embase (1980 to 2008 Week 40), PsychINFO (1967 to October Week 1 2008), EBM Reviews- Cochrane Central Register of Controlled Trials (3rd Quarter 2008), EBM Reviews- Cochrane Database of Systematic Reviews (3rd Quarter 2008). Studies were limited to include those published from 1990 to present day and English language.

The searches used subject search, relevant terms or key words, and text-word search. These words were topically broad, allowing identification of all the major research reports on the topic (i.e. cardiovascular disease, coronary disease, atherosclerosis, hypertension, hyperlipidemia, nurse-led, nurse managed). Numerous small searches were made on separate keywords, combining these to refine and delineate the search topic.

2.8 Search results

Seventeen studies met the inclusion criteria and these were included in this integrative review. Several included articles were the result of large trials and are clustered for the purposes of review in the study appraisals in Chapter Three, and in Table 4- Characteristics of included studies (located in the dissertation appendix). One large and relevant Scottish study provided six research articles included in this review (Campbell, 2004; Campbell et al., 1998; Murchie, Campbell, Ritchie, Simpson & Thain, 2003; Murchie, Campbell, Ritchie, Deans & Thain, 2004; Murchie, Campbell, Ritchie & Thain, 2005; Rafferty, Yao, Murchie, Campbell & Ritchie, 2005). Three studies were from the British Family Heart study held in twenty six

general practices within England, Wales and Scotland (Wood et al., Family Heart Group, 1994; W Wonderling et al., 1996). Three studies were from a cluster randomised trial, titled Change of Heart, involving twenty general practices in the UK (Hilton et al.,1999; Steptoe et al., 1999; Steptoe, Kerry, Rink, Hilton, 2001). The OXCHECK randomised controlled trial provided the author with three studies (Imperial Cancer Research Fund OXCHECK Study Group, 1995; Langham et al., 1996; Wonderling et al., 1996). Two studies related to the Southampton heart integrated care project, SHIP trial (Jolly, Bradley, Sharp, Smith, Mant, 1998; Jolly et al., 1999). The author recognises that these research reports relate to large studies, and that any potential theoretical, conceptual or methodological flaws would affect all the research findings. The use of the Literature Review Protocol (Appendix 2) assisted in the structured identification of all aspects of the included literature.

Consideration was given to the importance of including recent Australasian studies in this review, and in particular, the inclusion of New Zealand research (Horsburugh, Goodyear-Smith, Yallop, 2008; Horsburugh, Goodyear-Smith, Yallop, O'Connor, 2008). The inclusion of up to date New Zealand research provides evidence that may be critiqued for enabling best-practice in the current health climate in New Zealand, and has been central to the development of recommendations for practice which are discussed later in the dissertation.

In order to be assured that the search was inclusive of all relevant and current literature, a librarian experienced in academic literature research was requested to perform a check search. This provided the author with an assurance that the search was inclusive of all relevant literature for this review.

Details of the studies included in the review are shown in Table 4- "Characteristics of Included Studies".

Table 4 - Characteristics of Included Studies

Author/s	*Methods/Country/ Evidence Hierarchy*	*Participants*	*Interventions*	*Outcome measures*	*Findings*
Allen (2002)	RCT USA Level II	228 patients with elevated lipids and CHD. NURS (*n*=115) EUC (*n*=113)	Nurse-led trial: lipid management with NP. Usual care: feedback and general advice from primary care provider Intervention period: 1 year	LDL, lipids, lipoproteins, diet and exercise	65% NURS group reached target LDL-levels versus EUC 35% (*P*=.0001) Improved lipid profile was associated with healthy lifestyle changes in NURS group.
Campbell (1998); Campbell (2004); Murchie (2003a); Murchie (2003b); Murchie (2004); Murchie (2005); Rafferty (2005).	RCT UK Level II	1173 participants with CHD from 19 GP practices (Usual care *n*=580 Nurse-led clinic *n*=593)	Nurse-led clinic: secondary prevention clinic. Usual care: by GP Intervention period: 1 year F/up: 4 years.	General health status, lipid, BP, smoking status, aspirin, diet, exercise.	SF-36 domains were significantly improved at 1-year across 5 of 8 domains, reduced differences noted at 4 year f/up. Aspirin management improved in intervention group from baseline to outcome 11.7% vs. 3.2%, BP management 9.8% vs. 0.2%, lipid management 29.2 vs. 7.8, physical activity 4.4% vs. -1.1%, low fat diet 7.5% vs. 0.0%, non-smoking 0.2% vs. 1.9%.
Family Heart Study Group (1994); Wonderling (1996); Wood (1994).	RCT UK Level II	4185 men aged 40-59 and their 2827 partners from 26 general practices Intervention practices *n*=13 Control practices *n*=13.	Nurse-led programme using a family centred approach, with follow up according to degree of risk. Intervention period: 1 year	Total coronary risk score, smoking, weight, BP, cholesterol, glucose, cost.	At 1 year, improvement of coronary risk score in men was 16% (95% CI 11% to 21%), similar in women. Self report smoking was 4% lower, systolic BP 7mm Hg lower, diastolic BP 3mm Hg lower, weight 1kg lower, chol conc. by 0.1mmol/L, no observable reduction in BS concentration noted.
Hilton (1999); Steptoe (1999); Steptoe (2001).	RCT UK Level II	883 patients with 1 or more CVD risk factors from 20 general practices. Intervention practices *n*=10, control *n*=10.	Brief behavioural counselling on the basis of the stage of change model. Intervention period: 1 year.	Stage of Change. Diet, exercise, smoking habit, BP, lipid, weight, BMI	The likelihood of moving to action and maintenance was related to baseline stage with fat reduction, increased physical activity and smoking cessation. Brief interventional counselling provided according to Stage of Change may be beneficial.
Horsburugh (2008a)	Action research approach: assessing quantitative and qualitative data. NZ Level V	6 primary care providers: pilot general practices and other primary care settings.	Implementation and sustaining a nurse CVD risk assessment and management service. Intervention period: 2 years.	Identification of the components of the implementation and sustaining of a nurse-led CVD clinic.	Recommendations for the development and management of a nurse-led cardiovascular clinic in the NZ primary health care environment.

Horsburugh (2008b)	Case report NZ Level V	Mornington PHO in Dunedin	Assess the implementation strategy and assess initial outcomes at 6 months. Intervention period: 6 months	Number screened for CVD, assessment of implementation strategy	Organisational factors surrounding the implementation of a nurse-led cardiovascular clinic. 42% of patients had received a CVDRSK screening by 6 months of clinic, 32% had a CVDRSK score ≥30%.
Imperial Cancer Research Fund OXCHECK Study Group (1995); Langham (1996); Wonderling (1996).	RCT UK Level II	5 General Practices Intervention group *n*=2205 Control group *n*=1916	Nurse-led screening and health checks according to standard protocol (lifestyle advice and pharmacologic intervention), follow up according to risk factors. Intervention period: 4 years.	Cholesterol, BP, BMI, smoking; self reported diet, exercise and alcohol; cost of programme.	Positive benefits to nurse-led health checks at three years. Cholesterol 3.1% lower in intervention group (diff 0.19 mmol/L, 95% CI 0.12 to 0.26
Khunti (2007)	RCT UK Level II	20 primary care practices: Intervention group (*n*=505) Control group (*n*=658)	Two cardiac nurse specialist nurse liaised between practices- assessment, investigations, medication management and liaison between primary and secondary care. Intervention period: 1 year.	Medication, lipids, BP, smoking, diagnostic Ix	More patients in intervention group were prescribed beta-blocker (adj. OR 1.43, 95% CI 1.19 to 1.99), BP<140/85 (OR 1.61, 95% CI 1.22 to 2.13) and cholesterol <5mmol/L (OR 1.58, 95% CI 1.05 to 2.37) compared to usual care. CHF confirmation occurred in intervention group (OR 4.69, 95% CI 1.88 to 11.66), also noted improvement in SF-36 measures in intervention group.
Mainie (2004)	Intervention trial (pilot project) UK Level III	Cardiac out-patient setting 563 patient with CHD male (*n*=379) female (*n*=184)	Protocol driven nurse-led clinic- assessment of risk factors, drug management, lifestyle modification. Review dependent on risk factor management. Intervention period: 2 years.	Exercise, BP, BMI, cholesterol, smoking , alcohol, medication prescribing.	Positive results supported the nurse-led trial but this required intensive management. Exercise target was achieved by 39.9% at appointment 1, rising to 71.7% at clinic discharge. Target BP achieved by 69.9% at initial assessment, 86.8% at discharge. BMI <25 was observed in 39.2% at initial assessment, 53.4% at discharge. TC< 5mmol/L and LDL <3 mmol/L achieved by 59.6% initially, 81.3% on discharge. 46.3% classified as non-smoker initially, 60.5% on discharge. Smaller changes were noted with pharmacological management.

Moher (2001)	RCT UK Level II	21 general practices. Patients aged 55-75 years with CHD (*n*=1906)	Audit group: audit of notes; GP recall: audit and recall to GP (support to practices to identify and f/up patients, agreed treatment guidelines); Nurse recall: audit and recall to nurse (as per GP recall group plus nurses provided with education to implement clinic). Intervention period: 1.5 years	BP, smoking, cholesterol, medication prescribing	At 18 month f/up, nurse-recall, GP recall and audit groups showed BP (148/80, 147/81, 148/81 mm Hg), total cholesterol (5.4, 5.5, 5.5 mmol/L), smoking status (17%, 16%, 19%), antiplatelet prescribing (85%, 80%, 74%), minimal variation between groups for other prescribing. Advantage of nurse-recall group 10% (3% to 17%), GP recall 8% (1% to 15%), audit 2% (-6% to 10%).
McLoughney (2007)	Intervention trial UK Level III	Type 2 diabetes, receiving shared care from the diabetes centre or in primary care through a GP (*n*=96).	Protocol driven nurse-led clinic to manage CVD risk factors. Medication titration and patient f/up according to protocol. Intervention period: 1 year.	BP, lipids, HbA1c, patient contact.	Systolic BP reduced from 167 ±12 vs 132 ±8mmHg, p<0.001, diastolic BP 85±9 versus 70±7 mmHg, p<0.001. 92% achieved target BP. Hyperlipidemia and total cholesterol significantly improved with 91% achieving target control. 45% reached target HbA1c level of <7%.
McPherson (2002)	Pre-post intervention longitudinal, prospective pilot study. USA Level III	Patients in primary care outpatient clinic (*n*=436).	CVD risk assessment, patient education and counselling using algorithms. Intervention period: 2 years	BP, LDL cholesterol, smoking status	Pilot study showed positive results for nurse-led CVD risk assessment. From baseline to final visit, systolic BP improved from 155.8 to 143.4 mmHg, diastolic BP 94.4 to 84.0 mmHg, LDL from 4.15 to 3.80 mmol/L. 30% were reported to have stopped smoking.
McHugh (2002)	RCT UK Level II	Patients awaiting CABG (*n*=98). Usual care (*n*= 49) Nurse-led intervention group (*n*= 49)	Shared care programme-health education and interviews given by cardiac liaison nurse (in patient homes) and alternating with practice nurse (in GP setting). Intervention period: 15 months.	Smoking status, obesity, physical activity, anxiety and depression, health status, BP, cholesterol and alcohol intake.	Smoking cessation (nurse-led 25% vs. usual 2%, p= 0.001), reduce obesity (nurse-led 16.3% vs. usual 8.1%, p= 0.01), target systolic BP (nurse 19.8% vs. usual 10.7%, p=0.001), target diastolic BP nurse 21.5% vs. usual 10.2%, p=0.000), no significant difference between groups for chol. And SF 36. Anxiety and depression an exercise improved p<0.000).

Naslindh-Ylispangar (2008)	3-year follow up study Finland Level III	All men born in 1961 living in NE Heklsinki (*n*=273, 39.7% eligible males).	Lifestyle advice given to patients with elevated CVD risk. Intervention period: 3 years	Waist circumference, BP, glucose, triglycerides, LDL & HDL cholesterol.	Significant reductions in diastolic BP, HDL and LDL from baseline to follow up 3 years later. No significant changes were noted for waist circumference, and BMI and glucose readings increased in final measurements
Steptoe (1999)	Questionnaire survey. UK Level IV	GPs (n=107) and practice nurses (*n*=58) in 19 group practices (100% response rate).	Questionnaire to assess health professionals attitudes to the management of CVD in their practice setting.	Responsibility for health outcomes, perceptions of skills, opinions of efficacy of lifestyle change in managing CV disease.	A lack of training and support was considered a barrier and some perceived that their interventions were not influential. Those that felt well prepared to provide interventions believed they were influential, others had mixed beliefs about the effect of lifestyle counselling on modifying CVD risk.
Wood (2008)	RCT. 8 European countries Level II	6 pairs of hospitals (intervention patients *n*=1694; usual care *n*=1718; plus partners) and 6 pairs of general practices (intervention *n*=1257; usual care *n*=1128; plus partners)	Hospital nurse-led: nurse assessment of lifestyle, risk factors and drug treatment. Hospital usual care: not described. GP nurse-led: nurse assessment of lifestyle, risk factors and drug treatment. GP usual care: intervention not described. Intervention period: 1 year.	Smoking, diet, BMI, physical activity, BP, lipids and blood glucose, cardiac drugs.	Smoking cessation was higher in intervention groups compared with usual care. Dietary targets for saturated fats, fruit and vegetables and oily fish were met by a higher proportion of the intervention group, along with physical activity targets. There was no significant difference of BMI and abdominal circumference between the groups at 1 year. There was improvement in prescribing of cardioprotective drugs in only some groups.
Woodward (2005); Woodward (2006).	Prospective, interventional study. UK Level IV	Type II diabetes attending an outpatient clinic (*n*= 110)	Open clinical algorithm was used to manage antihypertensive, statin and asprin therapy, lifestyle advice. Intervention period: 2 years.	BP, HDL & LDL cholesterol, smoking, treatment modalities, lifestyle changes.	Improved risk factor management in nurse-intervention group. Mean BP reduced from 150/76 to 130/68 mmHg at 9 month review. HDL improved from 1.2 ±mmol/L to 1.4 ± 0.5 mmol/L (P=0.004). Microlbuminuria reduced from 47% to 28% (P=0.02), smokers reduced from 20% to 13% (P=0.01).

Table 5 - Characteristics of excluded studies

Study	*Reason*
Abegunde, D., Shengelia, B., Luyten, A., Cameron, A., Celletti, F., Nishtar, S., Pangdurangi, V., Mendis, S (2007). Can non-physician health-care workers assess and manage cardiovascular risk in primary care? *Bulletin of the World Health Organization*, 85 (6), 432-44	Not nurse-led
Bebb, C., Kendrick, D., Coupland, C., Madelely, R., Stewart, J., Brown, K., Burden, R., Sturrock, N. (2007). A cluster randomised controlled trial of the effect of a treatment algorithm for hypertension in patients with type 2 diabetes. *British Journal of General Practice,* 57, 136-43	Not nurse-led
Diabetes Prevention Program Research Group (2005). Impact of Intensive Lifestyle and Metformin Therapy on Cardiovascular Disease Risk Factors in the Diabetes Prevention Program. *Diabetes Care*, 38 (4), 888-94	Not nurse-led
Jiang, X., Sit, J., Wong, T. (2007) A nurse-led cardiac rehabilitation programme improves health behaviours and cardiac physiological risk parameters: evidence from Chengu, China. *Journal of Clinical Nursing*, 16, 1886-97	< 6 month intervention
Little, P., Dorwood, M., Gralton, S., Hammerton, L., Pillinger, J., White, P., Moore, M., McKenna, J., Payne, S. (2004). A randomised controlled trial of three pragmatic approaches to initiate increased physical activity in sedentary patients with risk factors for cardiovascular disease. *British Journal of General Practice*, 54, 189-95	< 6 month intervention
Jilcott, S., Keyserling, T., Samuel-Hodge, C., Rosamund, W., Garcia, B., Will, J., Farris, R., Ammerman, A. (2006). Linking Clinical Care to Community Resources for Cardiovascular Disease Prevention: The North Carolina Enhanced WISEWOMAN Project. *Journal of Women's Health*, 15 (5), 569-82	Not nurse-led
Reilly, V. & Cavanagh, M. (2003). The clinical and economic impact of a secondary heart disease prevention clinic jointly implemented by a practice nurse and pharmacist. *Pharmacology World Science;* 25(6): 294-98	Not nurse-led
West, R., Edwards, M., Hajek, P. (1998). A randomised controlled trial of a "buddy" system to improve success at giving up smoking in general practice. *Addiction*, 93(7), 1007-11	< 6 month intervention

Details of the studies excluded from the review are shown in Table 5- "Characteristics of Excluded Studies".

2.9 Summary

Chapter Two has provided a clear description of the methodology utilised to explore the characteristics of nurse-led interventions for the prevention and management of cardiovascular disease. The research questions have been developed in order to gain a greater understanding of the issues that either support or impede these initiatives. This chapter has described the process taken to search, manage, review and synthesise the retrieved literature, and in the following chapter, the results will be displayed having undergone initial data reduction.

CHAPTER 3:

INTEGRATIVE REVIEW RESULTS

3.1 Results of literature review

This section of the dissertation reports the initial phase of the integrative review, providing a clear descriptive summary of the included studies, reporting on the research results, and establishing initial themes relating to the review questions. These initial themes appear as headings. Critical appraisal of the research methods occurs and the included studies are summarised. The appraisal uses techniques such as grouping and clustering of concepts to establish the initial themes that arise from the included studies (Whittemore & Knafl, 2009). Many of the Chapter Three sections review groups of articles that have arisen from large multifaceted studies, as shown in Table 4- "Characteristics of Included Studies', where each study is described covering methods, participants, interventions and outcomes.

3.2 Summary of studies

The following section describes the included studies and extracts the initial themes that relate to the review questions. The search results undergo primary data reduction with the outcomes displayed in this chapter. This will complete the initial phase of the literature review.

3.2.1 Comparison of interventional counselling with usual health promotion

A randomised controlled trial assessed the effect of brief behavioural counselling with usual healthy lifestyle promotion among a population with an increased risk of cardiovascular

disease in the primary care setting (Hilton et al., 1999; Steptoe et al., 1999; Steptoe et al., 2001). General practices (n=20) were randomised to lifestyle counselling by behavioural methods or usual care. The following risk factors were used for patient inclusion: smoking, high cholesterol, or a combination of high BMI and low physical activity. Counselling based on the stage of change model was utilised by intervention nurses trained to alter modifiable risk factors- reduce smoking, dietary fat intake and increase regular exercise. The individuals stage of change (precontemplation, contemplation, preparation and action/maintenance) was assessed at four and twelve months.

The results indicated that the odds of moving to action/maintenance for behavioural intervention versus control patients at four months were 2.15 (95% CI=1.30, 3.56) for fat reduction, 1.89 (95% CI= 1.07, 3.36) for increased physical activity, and 1.77 (95% CI=0.76, 4.14) for smoking cessation (Steptoe et al., 2001). The results showed that the probability of attaining action/maintenance coincided with the baseline stage for all three activities.

Of the twenty participating practices, three withdrew during the course of the study, two of which continued collecting data on those that had already been recruited. One other practice was added during the project ensuring data was collected from ten practices in both the intervention and control arms of the study (Steptoe et al., 2001). The study did report several methodological flaws that may affect the interpretation and validity of the gathered data: the self-report data that may be subject to bias and error; recruitment of patients into the study used a variety of methods that altered as the study progressed. The population included those considered moderately affluent to the deprived and all occurred within practices within the UK, possibly disallowing replication to other settings. Practice self-selection may indicate motivated practice teams, who reported they had already been providing health checks. This

would potentially affect the client numbers that fitted the inclusion criteria and would have also affected the outcome results.

Nurse Preparation

Of the twenty practices that agreed to partake, one nurse from each of the intervention practices (n=10) was educated to use the Stages of Change model. The training enabled the nurses to understand the process of helping people to change, and taught them skills in the appropriate use of health promotion interventions and increased their ability to work in a patient-centred way (Steptoe et al., 2001).

Health Promotion

The intervention nurses were trained to recognise which stage the patient was in and therefore provide the appropriate support and education to encourage change. The goal of the smoking intervention was complete abstinence and was supported, if appropriate, with nicotine replacement therapy. Patients with elevated lipids were counselled regarding a low fat diet within the context of a healthy and well balanced diet. Patients with an elevated body mass index (BMI) in association with a lack of regular exercise were counselled regarding increasing their activity levels to twelve sessions of moderate to vigorous exercise per month. The order of which risk factors were targeted was negotiated between nurse and patient (Hilton et al., 1999).

Summary

This cluster of articles that arise from the Change of Heart study, demonstrate the benefits that may occur when brief stage-based behavioural counselling is utilised for lifestyle modification of a population with an elevated cardiovascular risk. It has shown the behavioural counselling principles are easily learnt and successfully utilised in a nurse-led

clinic (Steptoe et al., 2001). Although the nurses received training, the interventions were carried out after a relatively short training, and Steptoe et al. (2001) considered that the effects may have been lesser than that achieved by more experienced providers. A factor of this study was the importance that the nurse-led intervention be generalizable and applicable to a variety of primary health care providers.

3.2.2 Cardiovascular risk reduction using an open clinical algorithm

A prospective interventional study of two years duration was designed to evaluate the effectiveness of a nurse-led clinic to optimise BP control in patients with Type 2 diabetes, aiming for a systolic BP $\leq$ 140mmHg and diastolic BP $\leq$ 85 mmHg (Woodward, Wallymahmed, Wilding & Gill, 2005; Woodward, Wallymahmed, Wilding & Gill, 2006). Secondary outcomes included the reduction of other modifiable cardiovascular risk factors such as smoking, elevated lipids and the use of anti-platelet therapy. Patients received education and counselling regarding lifestyle factors. Results showed that blood pressure control was significantly improved by the end of the study, with 79% of patients at or below the target level, with this BP control maintained at the nine months review (Woodward et al., 2005). Treatment modalities utilised clinical algorithms to reduce cardiovascular risk including antihypertensive, lipid-lowering and anti-platelet therapy. Woodward et al. (2005) and Woodward et al. (2006) reported improved outcomes. The high density lipoprotein (HDL) improved from 1.2 ±0.5mmol/L to 1.4 ±0.5mmol/L (P=0.004) and the number of patients with microalbuminuria decreased from 41 (47%) to 25 (28%) (P= 0.02), with a fall of urinary albumin:creatinine ratio from 3.0 to 1.8 mg/mmol (P=0.01). They report the number of smokers reduced from 22 (20%) to 14 (13%).

The study limitations are acknowledged by the researchers, and include a lack of age limitation, which may have affected internal validity, and an absence of concealment causing

a probable 'Hawthorne effect'. These subjects were recruited from an outpatient diabetes clinic and had advanced disease at baseline. What must be considered in relation to the improved BP readings, is the effect of regular contact and the resultant reduction in 'white-coat hypertension' through 'desensitisation'. This effect is difficult to quantify, but should be considered when evaluating the results. Consideration should also be given to the impact of perceived increased support that occurred with the regular contact with the interventions nurses.

Clinical algorithms

The nurses were trained over a three month period by physicians, and used an open clinical algorithm to guide them on the use of antihypertensive, lipid lowering, aspirin therapy and lifestyle education. The treatment algorithm allowed titration of antihypertensive therapy by a stepwise four weekly dose and the addition of further drugs until target BP control was reached. The algorithm was 'open' allowing for any of the agreed drugs to be chosen according to existing medical conditions. Diabetic complications and treatment decisions were made on an individual basis.

Summary

The design of this study had several methodological weaknesses that may have affected the final results, and there was little detail on the nursing interventions. Taking this into consideration, results showed that a protocol-driven nurse-led clinic could effectively manage cardiovascular risk in Type 2 diabetics, and indicates that patients benefit from regular contact with health professionals whatever the therapeutic intervention. Woodward et al. (2005) recognised that the importance of constancy of care and the "human aspect of familiarity" (p. 1274) which patients found reassuring. The research results indicate the beneficial effect on health of the regular reassessment of modifiable risk factors and the reinforcement of

treatment regimes, patient education and support in order for patient's to be motivated and compliant with medication.

3.2.3 Secondary prevention in coronary heart disease

A randomised controlled trial, with a sample of nineteen general practices in northeast Scotland, evaluated over a four year period whether nurse-led clinics enhanced the secondary prevention of coronary heart disease. Seven reports are included in reviewing this large trial (see Table 4) (Campbell et al., 1998; Campbell, 2004; Murchie et al., 2003; Murchie et al., 2004; Murchie et al., 2005; Rafferty et al., 2005; Steptoe et al., 1999). Nursing interventions endorsed medical and lifestyle measures and included symptom assessment, aspirin promotion, review of blood pressure and lipid management, assessment of lifestyle factors and encouragement of positive behavioural change. Patient health status was measured using SF-36 domains.

At one year, results indicated improvements in five of eight domains in patients randomised to intervention clinics. Follow-up was dependent on clinical assessment (every two to six months was advised in the protocol), with the control group receiving usual care. The main outcome measures were of modifiable risk factors, total mortality and reported coronary events. Results indicated substantial improvement in the intervention group in all components of secondary prevention except for smoking cessation at one year, these changes remaining at four years, except for exercise. By follow up at four years, the control had similar results, likely due to the attendance of the control group to clinics after one year. At 4.7 years, 14.5% of the intervention group and 18.9% of the control group respectively had died, there was a reported incidence of coronary events in 14.2% of intervention group and 18.2% control group. A qualitative component of this study reported on health professional's perspectives regarding the barriers and facilitators to establishing and running a secondary preventative clinic within primary health care (Murchie et al., 2005).

The study had few participants lost to follow-up and patient characteristics were considered to be similar at baseline between the two groups. The main study limitation was considered to be crossover of participants from control to the intervention group. Qualitative data relating to this study provided several themes relating to nurse-led management of cardiovascular disease.

Patient Care

A majority of clinicians (medical and nursing) believed that the clinics improved patient care and patients were satisfied and empowered by the nurse-led clinics. This appeared to be a motivating factor in continuing to run the clinics in the medium to long term. Some clinics felt that patient care was being duplicated from care that was already being provided, three of these clinics stopped and did not restart. At these practices the GP's felt they could manage the prevention during routine consultations.

Nursing Skills

The development of nursing skills and autonomy were considered a positive factor. Nurses enjoyed the increased time with patients and the development of enhanced relationships. The need for formal training and support was considered essential, while this was noted as a barrier in some instances. There was training offered prior to the study commencement but a lack of support after that. This lack of support along with perceived isolation was noted, and a suggestion for a centralised support structure was made.

Collaboration

Some GP's and nurses considered that initiating the clinics had motivated and educated the practice team, producing a positive experience which included enhanced communication within the team. It was considered essential to have GP support and in most practices there was a nominated GP who advocated for the nurse-led clinic. In those clinics where support

was lacking and communication poor, clinics stalled. The researchers noted that successful clinics required GP's to devolve responsibility to the intervention nurses.

Infrastructure

Some GP's considered the clinics improved infrastructure and practice systems with a perceived reduction in both routine visits and cardiac emergencies noted. Perceived barriers surrounding practice systems were reported as a lack of financial incentive, sufficient rooms, and staff shortages including nursing and administrative support. The theme of a lack of external support was highlighted within the literature pertaining to this study.

Summary

The results at one year show the intervention group revealed a statistically significant improvement in most components of secondary prevention, although at long term follow up there was no significant difference between groups. At 4.7 years there was a reduced cumulative death rate and coronary event rate within the intervention compared to the control group. There was a positive view from health professionals involved in running the clinics, with most reporting that it improved patient care. However, several barriers to nurse-led management were noted including infrastructure and financial barriers, and internal and external nursing support of the extended role.

3.2.4 Nurse-led primary prevention of cardiovascular disease

The British Family Heart Study, a randomised controlled trial in twenty six general practices in thirteen British towns, studied a nurse-led programme using a family centred approach to assess and modify cardiovascular risk factors (Family Heart Study Group, 1994; Wood et al., 1994; Wonderling et al., 1996). In each town, practices were randomly allocated to intervention while an other acted as a comparison. The research designers used an innovative

approach by screening families rather than individuals because it was considered that lifestyle changes would more likely occur if the whole household were involved (Wood et al., 1994). The initial findings indicated that there was considerable scope for both the primary and secondary prevention of cardiovascular risk within the study participants and at one year, the overall reduction in coronary risk score was 16%, with a reported smoking reduction of 4%, weight loss of 1kg, systolic BP reduced by 7mm Hg, diastolic pressure reduced by 3mm Hg, and cholesterol concentration by 0.1mmol/L. The researchers recognised that bias created crucial anomalies in the interpretation of risk factor reduction, with the consideration that about half of the reduction in blood pressure was related to accommodation bias and that the observed reduction in smoking prevalence could be explained by non-returner bias.

Training and support

The nurses were recruited locally and received specialist training in the use of a computer, risk factor measurement, quality assurance and lifestyle counselling. The intervention nurses received ongoing monthly support (Wood et al., 1994).

Intervention Intensity

The interventions were frequent and time-consuming with the initial assessment lasting one and a half hours. Follow up was according to individual risk. Although the intensive family centred programme achieved an overall 12% reduction in coronary risk (Dundee risk score), the expense of such a heavy use of nursing resources was acknowledged to be beyond the resource capability of most general practices. In terms of life years gained, the study was effective at reducing risk.

Summary

The aim of the research was to quantify the extent of the cardiovascular risk reduction obtained in one year using a nurse-led practice based strategy that addressed cardiovascular risk in the middle aged man, and included his family. The nursing intervention was intensive, involved offering risk related lifestyle counselling and follow-up according to risk. The reduction in overall risk at one year was 12% and was not supported by funding streams. The long term maintenance of risk reduction is required to off-set the cost of this programme.

3.2.5 Health checks conducted by nurses in primary care

A randomised controlled trial design was set in 5 urban general practices in the UK with the objective to determine the effectiveness of health checks performed by nurses in primary care in reducing risk factors for cardiovascular disease (Imperial Cancer Research Fund OXCHECK Study Group, 1995; Langham et al., 1996; Wonderling et al., 1996). Results showed that the mean serum cholesterol was 3.1% lower in the intervention group than controls (difference of 0.19mmol/L) in women it was 4.5% lower and in men it was 1.6%. Self-reported saturated fat intake was also significantly lower in the intervention group. Systolic, diastolic BP and BMI were respectively 1.9%, 1.9% and 1.4% lower in the intervention group. There was a 3.9% difference in the percentage of subjects with a cholesterol concentration >/= 8mmol/L but no significant differences in the number with diastolic pressures >/= 100mm Hg or BMI >/= 30 kg/m. There was no reported difference in the prevalence of smoking or excessive alcohol intake. The researchers recognised that non-attendance at the follow up appointments in the intervention group likely caused bias due to analysing on an intention to treat basis.

Protocol

Nursing checks used standardised protocols, which included completing a medical history, lifestyle questionnaire and formalised dietary assessment. The intervention nurses were educated in the importance of recognising and following up patients with multiple risk factors using a patient centred communication model. Identified risk factors were followed up using a strict protocol. Initial consultations were assessed to take 45-60 minutes, with follow-up visits lasting 10-20 minutes.

Training and support

Nurses attended a two day induction course, an annual study day and monthly evening training session with the medical and nursing coordinators to maintain and develop the knowledge and skills required to manage a nurse-led cardiovascular clinic. A number of practices employed nurses specifically to perform the health checks while others combined the checks with their other nursing duties. Monitoring of nursing performance occurred with audiotaping of consultations, allowing a measurable check of nursing interactions and evidenced that nurses stratified risk appropriately and adjusted the level of follow-up accordingly.

Cost effectiveness

The cost effectiveness of the intervention was dependent on the assumed duration of risk reduction. The risk reduction was required to persist for at least five years for the intervention to be considered economical.

Summary

An inspiring feature of the OXCHECK trial was the self reported change in dietary and exercise habits after the provision of nurse-led education, the results similar at three year

follow up. The researchers reported no evidence that annual follow improved modifiable risk factors in comparison to intervention and subsequent follow up at three years. A consequence of the health checks was significant numbers of follow-up visits in both groups. The intervention was unsuccessful at altering smoking and excess alcohol consumption. The intervention nurses received training that could realistically be offered nationally.

3.2.6 Three methods of promoting secondary prevention

A pragmatic, cluster randomised controlled trial in Warwickshire measured the outcomes of 1906 people in twenty one general practices who were identified to have coronary heart disease (Moher et al., 2001). Patients were randomised to either an audit group (evaluation to primary health team), GP recall group (development of disease register with systematic recall of patients to general practitioner) or nurse recall group (development of disease register with systematic recall of patients to nurse-led clinic). Controlled variables were BP, cholesterol, smoking status, prescribing and titration of drugs. Findings indicated that assessment of all three risk factors was much higher in the nurse and GP recall groups (85%, 76%) than the audit group (52%). Mean BP (148/80, 147/81, 148/81 mm Hg), total cholesterol (5.4, 5.5, 5.5 mmol/L) and cotinine levels (% probable smokers 17%, 16%, 19%) varied little between the nurse, GP and audit group. Prescribing of antiplatelet drugs was higher in the nurse recall groups (85%) than the GP recall (80%) and audit (74%). The trial was recognised as being methodologically sound with the baseline participant characteristics being statistically similar and blinding of the research nurse. There are no details regarding agreed practice policies and prescribing algorithms.

Nurse recall group

Information of patients identified as having coronary heart disease was given to the nurses. Guidelines for secondary prevention were discussed and accepted by practice doctors in

consultation with the nurses along with a practice policy. The nurses received education to implement the programme, receiving ongoing support from the trial nurse facilitator to assist with setting up the register and recall system.

Prescribing

Prescribing of drugs showed little difference between the three groups. All three groups showed an increase in prescribing of lipid modification drugs, but there was no difference between the groups. Prescribing of antiplatelet drugs was higher in the nurse recall group (85%), 10% more than in the audit group, and 8% more in the nurse recall group than the GP recall group.

Summary

High quality care and the effective management of chronic disease occurs with a patient register, a systematic and planned recall system developed, increasing the probability of planned follow up. Outcomes indicated that follow up care by nurses was at least as effective as GP provided care, shown by a lack of difference in clinical outcomes between the two intervention groups.

3.2.7 The impact of brief counselling of cardiovascular risk

The aim of a three year interventional follow up study in Helsinki was to examine the effect of brief counselling on the cardiovascular risk factors among forty year old men (Naslindh-Ylispangar, Sihvonen, Sarna, Vanhanen & Kekki, 2008). The research design is described in Table 4- "Characteristics of included studies". The goal of the brief counselling was to increase the participants knowledge of a healthy lifestyle and educate them about cardiovascular risk factors. Education was provided about a cardioprotective diet and physical activity. Risk factors assessed included waist circumference, BMI, diastolic and systolic BP, HDL, LDL, triglycerides and fasting blood glucose. At the first follow up at one year, an

improvement was observed compared to the baseline values but by the final measurement, almost all the risk factors, except LDL and HDL, had returned to baseline. The researchers recognised that study limitations included a relatively low response rate and high drop out over the three year period which reduced the final number of participants.

Brief Intervention

The health nurse gave a forty five minute counselling session which included the provision of a brochure for educational reinforcement. The counselling followed current guidelines and was evidence based. The nurse provided interactive education to the patient regarding the results and the impact on their health. Using a client-centred education approach, the nurse assisted the patient in goal setting and provided lifestyle education.

Summary

The results showed that the short-term counselling had a positive impact on reducing risk factors during the first follow-up in 2002, but was not sufficient to produce ongoing effects for all risk factors at three years. The results indicate that more regular education is required for sustained lifestyle change. The researchers noted that the lifestyle education should be provided according to the participants readiness to change (Naslindh-Ylispangar et al., 2008).

3.2.8 Nurse-led intervention clinic to reduce cardiovascular risk in diabetes

Patients with Type two diabetes attending a diabetes specialist service at Blackpool Victoria Hospital who had poorly controlled hypertension or hyperlipidemia, were invited to take part in the intervention study for effective control of BP, lipid control and other vascular risk factors (McLoughney, Khan & Ahmed, 2007). Variables included systolic and diastolic BP, total cholesterol, triglycerides, LDL, HDL, HbA1c and body weight. Ninety six people were recruited with ninety four people completing the study. Seventy seven patients were

hypertensive at first visit, antihypertensive agents were either initiated or titrated, resulting in a significant reduction in systolic BP (167 ± 12 versus 132 ± 8 mmHg, $p<0.001$) and diastolic BP (85±9 versus 70±7 mmHg, $p<0.001$). Seventy two patients (92%) reached the target BP. Cholesterol levels in fifty nine patients treated for hyperlipidemia, total cholesterol (6.0±9 versus 3.9± 0.7mmol/L, $p<0.001$) and triglycerides (4.2±0.8 versus 2.4±1.2mmol/L, $p<0.001$) improved. Fifty two patients (91%) achieved the target lipid profile control. The mean glycosylated haemoglobin level improved (8.1±1.5 versus 7.4±1.5%, $p<0.01$) and 45% reached target glycaemic control (HbA1c< 7.0%). Of the known ten smokers, four had quit by the completion of the study.

Protocols

The nurse-led clinic was protocol driven for the management of hypertension, hyperlipidemia and other poorly controlled risk factors. The protocols were developed according to the current best practice management guidelines, were agreed to by the diabetes team and the local drug and therapeutic committee. A uniform therapeutic policy had been adopted which was based on a stepped care methodology. Each person was reviewed on an average of three times in the nurse led clinic.

Medication

Drugs were titrated according to the patient's treatment response and the previously agreed study protocols. Drug titration continued until either the pre-defined targets were met, maximum dose of drug was attained or drug dosage caused side effects. The inclusion of any additional medication was discussed with the medical team. The researchers noted that all drugs used in the study were administered once daily and were well tolerated with a small number of side effects (McLoughney et al., 2007).

Summary

This study results indicated that nurse led clinics can be effective at improving cardiovascular risk factors, including hypertension and hyperlipdemia, in patients with type two diabetes. Attendance at the nurse-led clinic and patient drug compliance was regularly monitored, the researchers recognising that the strategies should be patient centred, focusing on multifactorial cardiovascular risk reduction. The research by McLoughney et al. (2007) supports a multi-disciplinary and multi-professional approach to cardiovascular risk management, utilising clear evidence-based treatment regimens.

3.2.9 Nurse-based pilot program to reduce cardiovascular risk factors

A pilot study was developed to evaluate patients' achievement of cardiovascular risk factor management using a nurse-led programme in a Minneapolis primary care outpatient setting (McPherson, Swenson, Pine & Leimer, 2002). Patients were encouraged to attend the clinic if they were noted to have dyslipidemia or hypertension unresponsive to management, or were users of tobacco. Pre and post measurements were taken for the 436 patients who attended the nurse-led intervention clinic. Results showed that there were statistically significant reductions achieved from baseline to the final measurement in systolic blood pressure (from 155.8 to 143.4 mmHg), diastolic blood pressure (from 94.4 to 84.0 mmHg), and LDL reduction (from 4.15 to 3.8 mmHg) ($P<0.001$ for all). Of the forty tobacco users who participated in the programme, twelve (30%) were noted to have quit (McPherson et al., 2002). The pilot study was discontinued after two years as expenses incurred running the clinic were greater than the revenue brought in by the nurses. Methodological limitations included the lack of a control group in order to compare results, along with a self-selection bias and the possibility of the Hawthorne effect, which could account for the improvements noted in this study. This pilot study provided recommendations for a more rigorous study in the future, including randomisation and the active recruitment of the high-risk patient.

Nursing interventions

The nurse-led consultation incurred a patient fee and included an initial consultation with a comprehensive risk assessment, patient education and lifestyle counselling. During the assessment the nurse reviewed recent laboratory results, BP readings, and determined which cardiovascular risk factors were present, the programme length being client centred and based on clinical risk factors. Initial consultations usually lasted forty minutes and approximately twenty minutes for each follow-up session. The mean number of patient visits was 4.1 (range 2-15), the mean intervention period was 6.9 months (range, 1 week to 24 months). Two factors noted to be associated with achieving a normal LDL cholesterol level included lipid lowering medication and a longer time in the intervention programme (p=.009).

Algorithms

The algorithms developed for the management of the risk factors guided the nurse in establishing a personalised care plan for each patient. The nurse discussed the recommended frequency of medical tests, provided education on diet and exercise and reinforced the importance of pharmacological management. The intervention nurse was trained in smoking cessation counselling and offered follow up telephone support to the patient.

Collaborative practice

Physicians were consulted for patients requiring medication changes or if there was a serious change in their wellbeing. Physicians found the programme engaged and successfully managed three common primary health care issues- patient under-use of medication, a lack of physician time for behavioural counselling, and the ability to provide advice on cardiovascular risk reduction.

Summary

This study utilised a nurse who was recognised to be well integrated into the practice as part of the team, this being considered an important aspect of the success in this nurse-led intervention. The positive health outcomes were believed to have occurred due to the nurse's role in assessing and providing ongoing management of patient risk factors, timely collaboration with health care professionals, supporting positive lifestyle modification and pharmacological titration.

3.2.10 Effectiveness of a nurse-led secondary prevention clinic

A two year hospital based pilot project was developed to assess patient risk factors six months post cardiac event, assessing the meeting of government targets, determining the influence of a hospital- based nurse-led secondary prevention clinic on reducing risk factors and maximising pharmacological management (Mainie, Moore, Riddell & Adgey, 2005). The results were positive for nurse-led intervention concerning all the outcome measures, with pharmacological management of all the modifiable factors. The exercise target was achieved by 39.9% at the first appointment, this increasing to 71.7% on discharge. BP management was attained by 69.6% at the initial appointment, increasing to 86.8% on discharge. BMI <25 was measured in 39.2% at initial assessment and increased to 53.4% at discharge. Cholesterol targets were met in 59.6% at initial consultation and had increased to 81.3% on discharge. Smoking status was reported as 46.3% non-smokers at the first appointment, while on discharge, 60.5% self-reported as non-smokers. Methodologically, strengthening of the validity of intervention results would have occurred if there was randomisation of patients into usual care and intervention groups.

Intervention intensity

The intervention intensity related to meeting pre-determined objectives, with several patients attending more frequently than others. The average number of visits were two to four, with those requiring drug inauguration or titration requiring less intervention than those receiving only lifestyle modification. The study subjects were referred to the GP for ongoing follow up of risk factors and to check and maintain targets. Patients received verbal and written assistance with regular follow up.

Collaboration

Written recommendations regarding patient medication was made by the clinic nurse to the general practitioner via a clinic letter. Nurse-led management protocols were negotiated in conjunction with the cardiologists and hospital pharmacist, and included a structured review format to evaluate patient response to the nurse-led interventions.

Summary

The results showed that nurse-led management of cardiovascular disease can provide immediate and significant benefits to patient's health with regard to modifiable risk factors, including the effective use of prophylactic pharmacotherapy. This project promoted collaboration and partnership between primary and secondary care services and demonstrating inter-professional collaboration between nursing and medicine.

3.2.11 Patients on a waiting list for coronary artery bypass surgery

A randomised controlled trial conducted over fifteen months evaluated the efficacy of a nurse-led 'shared care'[2] programme to improve coronary heart disease risk factor levels, general

[2] 'Shared care' is defined in McHugh et al. (2001) as care provided by a specialist cardiac liaison nurse, liaison nurse in the home and the general practitioner team nurse.

health status, reduction of anxiety and depression in patients pending coronary artery bypass grafting (McHugh et al., 2001). The programme provided health care education in which the frequency of educational sessions was assessed on an individual basis, according to established need. Results reported by McHugh et al. (2001) showed that when compared with patients who received usual care, those participating in the nurse-led programme were more likely to stop smoking, reduce obesity and reach BP target values. There was no observable difference between groups in proportion of patients who reached target cholesterol results. There was however an important difference in general health status scores across all eight domains of the SF-36 health survey in the groups with levels of anxiety and depression improving, including time spent being active. Research limitations were few but included a lack of blinding of the nurse collecting data, and the erroneous results of self-reported smoking status.

General health status

The responses related to health knowledge in the previous four weeks with the presence of anxiety and depression being assessed using the hospital anxiety and depression scale[3]. A questionnaire was developed to ascertain the patient views of the service in terms of its support in making lifestyle changes, ability to reduce anxiety, as well as assessing the improvement of information sharing and general satisfaction with the nurse-led service.

Stage of Change

Interventions that addressed behavioural risk factors (smoking, physical inactivity, poor diet and excess alcohol) were based on patients stage or readiness to change. Those not ready to change were given generalised advice while those more responsive were supported to appraise both the positive and negative aspects of the health changes.

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[3] Zigmond, A., Snaith, R. The hospital anxiety and depression scale. *Acta Psychiatr Scand.* 1983; 67, 361-70, as cited in McHugh et al. (2001).

Summary

This nurse-led model of care shows effective care management of cardiovascular risk factors, with reducing anxiety and depression and improving patient perception of their general health status. This occurred through improved distribution of existing services, promotion of communication with the patient and amongst health care providers, and the application of evidenced based guidelines. The study showed that those receiving usual care had a deterioration in their outcome measures.

3.2.12 Management of hypercholesterolemia in patients with heart disease

A randomised controlled trial was developed in an American hospital to test the efficacy of a nurse case management programme to lower blood lipids in patients with established coronary artery disease (Allen et al., 2002). Patients were engaged during hospital stay, the control group received lipid management through lifestyle modification and pharmacotherapy from a nurse practitioner for one year in addition to usual care (NURS group), or to usual care enhanced with feedback on lipids to their primary provider and/or cardiologist (EUC group). The results showed that significantly more patients in the NURS group than the EUC group achieved pre-determined cholesterol levels with significant improvements in reducing dietary fat intake and exercise routines. There was no significant change in BMI between groups.

Research limitations included a potential population bias by excluding adults that lived greater than seventy five miles from the hospital, and by excluding participants if the physician objected to the individual's research participation. The interventions were multifaceted creating difficulties it defining what part of the intervention produced the greatest effect on the outcomes.

Nurse case management

Patients randomised to NURS group received nurse case management which included counselling for lifestyle modification and the addition or titration of lipid lowering medications. Follow up phone calls augmented the lifestyle counselling and advised on suitable adjustments in medications according to follow-up lipid results administered to a protocol. The nurse spent an average of 4.5 hours per patient in the one year duration of the programme, each patient being contacted seven times. 70% of the nurses' time was spent counselling the patient, 26% time spent on follow up documentation including patient feedback, reviewing laboratory results, and collaborating with other health care professionals.

Collaboration

During the intervention period the NP and the primary provider and/or cardiologist collaborated in managing the patients' lipids. The physicians gave permission for the NP to prescribe and monitor lipid-lowering drug therapy.

Summary

This study showed that through the use of case management, NPs may potentially augment the management of patients with known coronary heart disease through assessing and managing treatment gaps. Nurses were shown to enhance drug acceptance and optimisation, the research indicating that they appeared to successfully abide to treatment algorithms. The positive effect seen in this study, was considered to be related to strict management of drug interventions and lifestyle modifications (Allen et al., 2002).

3.2.13 Nursing initiatives in primary care: An approach for risk reduction

The aim of a MoH funded, two year study was to evaluate nurse led cardiovascular management across several pilot sites in New Zealand (Horsburugh, Goodyear-Smith &

Yallop, 2008a). An action research approach was used, included questioning and evaluation of the team experience, and assessment of the ongoing project meetings in order to determine the requisites of a nurse-led service. The main focus was assessment of the healthy population, the establishment of a systematic nurse-led cardiovascular screening programme with academic leadership and support being provided to the team.

The programme was implemented in several practices incorporating a wide spectrum of population, gathered data on quantitative screening results and thematic analysis of the qualitative aspects of running a clinic. Research limitations included that the study participants altered as the research progressed, with the researchers utilising information from new sites to augment their findings. There was little detail on nursing interventions other than stating the management of patients was based on national guidelines. The research was successful in identifying several intrinsic aspects of managing cardiovascular risk in the New Zealand primary health environment, but provided no detail on the quantitative results.

Planning and practice issues

An action-orientated plan was developed, allowing the general practices involved in the research to respond immediately to evolving issues. Appropriate management, leadership and vision with the development of clinic advocates within the team, was considered essential to the success of the clinics. The development and support of defined roles within the team was described, and included the recognition that nurses extending their roles required leadership along with clinical and professional support. Quality assurance and practice audit was acknowledged to monitor nursing skills and clinical competence. An emphasis on collaboration across the practice environment was apparent from the research findings.

Nursing competency

Several competencies were considered essential, namely:

- Understanding the CVD guidelines/evidence-based practice;
- Consultation processes (time management);
- Motivational interviewing/goal setting;
- Use of information technology;
- Audit/quality improvement;
- Medications;
- Cultural considerations
- Population health approaches
- Health promotion (Horsburugh et al., 2008a, p. 178).

The researchers described additional resources that were considered necessary to maintain the nursing service, and included: job description; nurse appointments and administrative support; provision of committed nursing time and consultation rooms; the availability of patient information and resources to support the health education (Horsburugh et al., 2008a).

Collaboration

Collaboration occurred within the practice team and with external providers. The action-orientated approach required practice management, GP's and nurses to work together to provide a responsive service that supported both health professional and patient needs. Intervention nurses referred to other health providers including community organizations to support lifestyle modification, the GP, Green Prescription, dietician and smoking cessation counsellors. The researchers recognised that cultural awareness and collaborating with the whanau, was essential in the successful management of chronic disease in the Maori population.

Summary

The project demonstrated that pragmatic planning leads to a successful CVD risk programme. The research reported that strong leadership, collaboration and team work, along with the appropriate competencies and practice support provided the framework for successful nurse-led management of cardiovascular disease.

3.2.14 Implementation of a nurse-led screening clinic in primary care

A case study methodology was used to report on the development of a nurse-led cardiovascular (CVD) screening clinic at the Mornington Health Centre in New Zealand. The paper reports on the progress of CVD screening initiative (Horsburgh, Goodyear-Smith, Yallop & O'Connor, 2008b). Practice infrastructure, leadership and support was initiated prior to clinic development, with an ongoing educational programme for RNs and GPs provided by a nursing leader. Clinic planning had allocated funding streams to enable a free thirty minute initial assessment, and for those with a risk greater than 15%, a free appointment with the GP for further assessment and pharmacological management. The practice target was 80% of the eligible population assessed within three to four years, focusing on the target population groups of Maori, Pacific Islanders, males and the diabetic patient. By six months of clinic initiation, 42% of eligible patients had been screened for cardiovascular disease risk, with some returning for the three-month follow up. The GP's had screened 21% and the nurses 79%, and by six months 42% of the target population had been screened.

Collaboration and support

The nurses collaborated with the clinic GP's who were available for supervision and support with patients recruited to the programme. Additional specialist nursing hours along with dedicated administrative assistance were assigned to enable a systematic population screening, the programme overseen by a nurse development manager.

Nursing preparation

A visiting practice facilitator enabled the team to plan a practice-led organizational development with quality improvement. The care model utilised methods from a MoH funded project to assist in the implementation of the plan.

Organisational factors

Fundamental factors were identified that contributed to the success of this programme included organisational philosophies, management, funding and infrastructure (Practice Management Systems, Decision Support Tools), practice capacity, and clinical and nursing support (Horsburugh et al., 2008b).

Summary

The report describes the factors that support or impede the development of a successful screening clinic including organizational and clinical factors. The researchers describe the intrinsic factors that have resulted in the Mornington Health Centre reaching their predetermined target.

3.2.15 EUROACTION - cardiovascular disease prevention programme

The EUROACTION study was a matched, cluster-randomised, controlled trial held in eight European countries. The aim of the study was to assess the efficacy of a nurse-coordinated multidisciplinary, family based programme in improving care and preventing the development of cardiovascular disease (Wood et al., 2008). The hospital intervention programme included a multidisciplinary assessment of lifestyle, risk factors and drug treatment by a nurse, dietician, and physiotherapist, with couples attending at least eight sessions (once weekly) with assessment from each team member. The cardiologists introduced and titrated the cardioprotective drugs, risk factors and medication adherence monitored by the nurses. In the

general practice centres, the programme started with the same nurse assessment and management, with the family doctors assuming responsibility for drug management. Results showed that a greater proportion of the intervention participants and their partners achieved the lifestyle, risk factor, and drug targets for cardiovascular disease prevention, except for those with an elevated BMI which showed no significant differences between the intervention and the usual care group. Research limitations described by the authors included that the study was statistically underpowered due to low recruitment, differences in patient characteristics between groups, and disparity between pairs of centres for some results. An underestimation of treatment effect may have occurred as the centres that randomised to usual care were aware that they would be audited within a year. The initial assessment would have signalled a need for change, and finally, almost a third of the usual care patients would be assumed to have received some form of cardiac rehabilitation, similar interventions to EUROACTION.

Motivational Interviewing

Patients were encouraged to achieve a healthy lifestyle with support from their families, other people attending the programme, and the health professionals. The Stages of Change model and motivational interviewing were used to encourage healthy lifestyle change.

Summary

EUROACTION is a preventive cardiology model that shows that a nurse-led, multidisciplinary, family based cardiovascular programme can improve lifestyle and risk factors for some groups, and can be utilised effectively in routine clinical practice.

3.2.16 Attitudes of cardiovascular health promotion among GP's and nurses

A qualitative study in the United Kingdom was designed to assess the attitudes of GP's and practice nurses, gathering knowledge on opinions about efficacy and judgement of clinical

skills (Steptoe et al., 1999). A questionnaire was sent to 107 GP's and fifty eight practice nurses from nineteen group practices. The questionnaire consisted of a series of philosophical statements rated on a seven point scale, and considered four issues: who had primary responsibility for health promotion, how confident clinical staff were in their own lifestyle counselling skills, the discerned efficacy of counselling for cardiovascular risk modification, and finally, the importance of cardiovascular risk reduction. Although the study was relatively small, it had the unusually high response rate of 100%.

Responsibility of health promotion.

A majority of the respondents agreed that the most appropriate person to provide health education was the practice nurse with significantly more nurses agreeing that their role was both disease treater and health educator (GP 59.0% versus nurse 64.3%).

Perception of lifestyle counselling skills

A statistically similar number of doctors and nurses realized that they felt properly trained to provide counselling advice (GP 48.66% versus nurse 48.2%), with more nurses acknowledging that health professionals are effective in educating patients to modify their lifestyles (GP 24% versus nurse 33.9%).

Efficacy of lifestyle advice

Generally, nurses were more confident that their counselling led to lifestyle modification, with 53.6% believing that lifestyle counselling is very effective. Both the GPs and nurses agreed that lifestyle advice was necessary for the effective management of both hypertension and high cholesterol, with a consensus that this treatment assisted the management of obesity and inactivity. Only 34.6 % of responding GP's and 23.2% of nurses considered that lifestyle counselling was effective in altering cigarette smoking habits.

Cardiovascular risk identification

The GPs and nurses had different opinions regarding their role in the identification of cardiovascular risk factors. Both groups believed that the identification of hypertension (GP 81.0% versus nurse 82.1%) and cigarette smoking (GP 89.5% versus nurse 80.4%) were an important part of their every day work, while 29.6% of GP's and 56.4% of nurses believed that assessing for elevated cholesterol was an important part of their role. GP's tended to have a reduced belief that it was their role to identify obesity (GP 42.9% versus nurse 74.5%) and physical inactivity (GP 29.8% versus nurse 66.1%), while nurses were more likely to accept that this was a part of their role.

Summary

Both the GP's and nurses recognised that health promotion was the nurses are of expertise, with doctors believing it was only a part of their role. Many of the respondents felt they were not particularly well trained in lifestyle counselling, and evidenced a lack of confidence in their skills. They acknowledged that their effect on individuals was limited, both groups observed that lifestyle counselling had little effect on smoking cessation.

3.2.17 Secondary prevention disease management programme in primary care

A cluster, randomised controlled trial of 1316 patients with coronary heart disease from twenty primary care practices in the UK, reviewed the efficacy of a nurse-led cardiovascular disease management programme (Khunti et al., 2007). In the intervention groups, two nurse specialists trained in the management of heart disease travelled between the practices holding weekly clinics. The intervention included patient assessment, confirmation of diagnosis by appropriate investigations, medication management and titration, home visits when required, and liaison between primary and secondary care. Follow up occurred twelve months from date of recruitment. Patients in the control group received usual care from their primary health

care team. Primary outcomes included treatment with a beta blocker (if history of previous MI), recorded cholesterol in last year and treatment with ACE (in patients with ventricular dysfunction). Secondary outcomes included patients requiring confirmatory diagnosis and the measurement of patient quality of life. Results evidenced that the assessment of risk factors was higher in the intervention group. Smoking cessation intervention occurred in 67% of the intervention group compared to 45% in the control group. At follow up, more patients had adequate BP control and cholesterol was noted to be lower in the intervention group. There was no statistical difference between groups in respect to treatment with ACE inhibitors. Methodological limitations included a lack of blinding and strengths included its generalizability. The groups were considered well balanced and there was little participant withdrawal from the study.

Quality of Life

At follow up, there were significant differences in SF-36 scores for physical functioning, general health, vitality, social functioning and mental health. Notably, there was no significant differences in any of the SF-36 health domains in patients with a confirmed diagnosis of left ventricular systolic dysfunction when comparing patients in the two study groups at follow up.

Summary

A disease management programme can lead to an improvement in the management of patients with proven coronary heart disease. This study evidenced an improvement in quality of life in those with coronary heart disease but no difference in those with congestive heart disease.

3.3 Summary

This chapter has completed the initial phase of the integrative review using a previously described method to systematically gather report themes, and identify some of the strengths and limitations of the seventeen included studies. The initial appraisal has resulted in a descriptive summary of the included studies, extracting themes relating to the review research questions, and provided the sub-headings within the study reports. Following the integrative literature review methodology, these themes will be further synthesised in chapter four.

CHAPTER 4:

ANALYSIS OF LITERATURE REVIEW

4.1 Introduction

Through the utililization of the integrative literature review model described in Chapter Two, this section details two themes elicited by this method. Whittemore and Knafl's (2005) model allows recognition of patterns, themes, relationships and/or conclusions. Synthesis of the two initial themes as described in Chapter Three has led to conceptualisation of the data in sub-themes, represented by headings in this chapter. Thus, data extrapolated from multiple individual sources in the previous chapter are further synthesised to allow literature comparison, and development of important and accurate themes, as described in the integrative review literature (Centre for Reviews & Dissemination, 2009; Joanna Briggs Institute, 2009; Webb & Roe, 2007; Whittemore & Knafl, 2005).

All reviewed literature described registered nurses working in an extended role with a scope of practice that is responsive to the population needs. A diversity of nursing roles and the willingness to extend and expand their scope of practice is apparent throughout the research literature. Examples did include the ability to provide assessment and effective counselling for behaviour modification, to the clinically advanced role of initiating and monitoring medications. This concept is supported by other literature that is not included in the review (Allen & Scott, 2003; Clare & Sandys, 2002; Courtney & Carey, 2007; Page, Lockwood & Conroy-Hiller, 2005), reinforcing the theme that advanced practising nurses constantly alter their professional boundaries, adapting their scope on case by case basis (Lillibridge, Axford

& Rowley, 2000). This fluidity of scope is recognised to be required in the roles described in articles included in this review.

Several commentators state that nurse-led management of coronary heart disease is as effective, if not better than physician-led care (Page et al., 2005; Joanna Briggs Institute, 2006), the objective of this review is to understand what the intrinsic factors are that have led to these findings. Below the two themes arising from the review are presented. The first theme titled 'Preparation and support of the nurse' is comprised of five sub-themes. The second theme title 'Nursing management of cardiovascular disease' contains seven subsidiary themes.

4.2 Preparation and support of the nurse

Preparing and supporting the nurse for the extended roles required to provide a nurse-led cardiovascular management was a theme evident throughout the literature and included the wider concepts of educational preparation, mentoring and collaboration.

4.2.1 Educational preparation

The educational qualifications of the research nurses was not routinely depicted within the literature, however several studies supplied more details than others, providing the reviewer with guidance as to the expected level of professional attainment for such a role (Hilton et al., 1999; Murchie et al., 2005; Wood et al. 2008; Moher et al., 2001; Imperial Cancer Research Fund OXCHECK Study Group, 1995). Two New Zealand studies provided more specific details on educational requirements for the role of nurse-led management of cardiovascular disease (Horsburugh et al., 2008a; Horsburugh et al., 2008b) which included the concept of a nurse with both clinical and management skills to lead and develop the nurse team. It is

insinuated throughout the literature that nurse-led management of patients is expected to improve patient adherence to lifestyle modification and drug compliance, although as described, there was little specificity in much of the reviewed literature surrounding what individual preparation nurses required or received in order to make them proficient at providing nurse-led cardiovascular risk reduction.

Horsburugh et al. (2008a) describe what they consider the knowledge and skill competencies required in order to fulfil the role. They include an understanding of the cardiovascular guidelines, time management, the consultation process and the ability to perform motivational interviewing and goal setting. In addition, fostering clinical excellence through appropriate educational background and monitoring of practice is widely recognised and supported by the literature. The author would conclude therefore, that the level of educational requirements for nurses involved in the nurse-led management of cardiovascular disease would relate to the degree of specialised advice or intervention provided by the nurse.

Nurses are required to understand the pathophysiology of cardiovascular disease and be competent in initiating and titrating pharmacological interventions to be undertaking nurse-led clinics, yet only one study provided details of a NP in the role of a designated prescriber (Allen et al., 2002). No studies provided set guidelines or described the necessary competencies for an RN initiating and titrating medication[4], a role that requires advanced knowledge.

The literature does suggest that nurses in extended or nurse specialist roles are experienced within their clinical area of practice. Several reports stated the intervention nurses were

[4] The author recognises the legal criteria and preparation required for nurse prescribing in the UK.

specialists or experienced, however there was no mention of formal post-graduate qualifications or years of practice. Indeed, only one study stated that the nurse recruited was educated to degree level and had a wide experience of chronic disease management (McLoughney et al., 2007) and one study employed a NP as a case manager (Allen et al., 2002).

The literature suggested that the specialist nurses received 'on the job' training, learning much of what was required to perform their advanced role from peers and physician colleagues (Imperial Cancer Research Fund OXCHECK Study Group, 1995; Moher et al., 2001; McLoughney et al., 2007; Woodward et al., 2006). Moreover, the literature failed to supply specific details of nursing preparation that supported this assumption. Receiving training and education from interdisciplinary forums (Hilton et al., 1999; McLoughney et al., 2007; Steptoe et al.; 1999; Steptoe et al., 2001) showed inter-professional collaboration, which provided the intervention nurses with disease management skills to significantly improve patient cardiovascular risk profiles and meet the pre-determined targets.

In summary, a majority of the research articles provide little details on nursing education and preparation but they do describe many intervention nurses receiving support and education inter-professionally. However, the literature supports utilising specialised and well prepared nurses to manage cardiovascular disease in the primary health care setting, and illustrates a variable proportion of preparation occurring within the practice setting.

4.2.2 Recruitment of the intervention nurses

Within the theme of training and preparation for the nurse-led role, a sub-theme developed surrounding the concept of recruitment of nurses for the nurse-led positions. All the roles required nurses to step-up into the positions of nurse-led management of cardiovascular

disease, with the reviewed literature showing different mechanisms for recruiting nurses into the role. For example, larger primary care practices may potentially have the critical mass of clinical staff to support combining practice nurse roles with that of the specialised cardiovascular disease management role, thus recruiting from within the practice (Imperial Cancer Research Fund OXCHECK Study Group, 1995; Wonderling et al., 1996). These practice-based nurses may have shown an interest in the management of chronic disease (Horsburugh et al., 2008a) or alternatively, they may also have found themselves in the role by default having been taken "away from routine work" (Murchie et al., 2005, p.527). Factors beyond nursing such as issues with nursing attrition (Murchie et al., 2005), critical mass and availability of dedicated rooms (Horsburugh et al., 2008a; Horsburugh et al, 2008b) have a bearing on employment settings and nursing roles. In contrast, some nurses were employed specifically to perform research duties providing an initial health check, lifestyle advice, and follow-up care according to degree of risk. It must then follow that practices have a critical mass of nursing staff, or conversely, the ability to recruit to the role. Therefore, we may acknowledge that nurses providing the interventions came from different practice backgrounds, bringing with them a variable amount of experience into the role.

4.2.3 Preceptorship and mentoring

Preceptorship and mentoring, widely recognised as support mechanisms for nurses, were openly discussed in two New Zealand studies (Horsburugh et al., 2008a; Horsburugh et al., 2008b). However, the process of preceptorship or mentoring was evident as a common factor that evolved in tandem with the theme of nursing preparation and support, and was noted as a concept in all the included literature.

Mentoring may occur across the team providing the cardiovascular disease risk assessment and management service (Horsburugh et al., 2008a). This implies that support is beneficial for

the entire practice team when nurses develop or negotiate roles that move beyond what is considered to be the conventional nursing role. Mentoring of a practice team invites critical reflection, highlighting potential as well as actual issues, and provides an opportunity for the team to deliberate, measure practice development and initiate assistance as required (Horsburugh et al., 2008a). It is widely acknowledged that the ability to reflect on practice is a core learning technique used widely as a professional development technique (Palmer & Kaur, 2003) and assists by employing problem-solving skills, as described by the successful action-orientated approach (Horsburugh et al., 2008a). Although this review focuses on the nurse as the intervention provider, mentoring the team as a unit is shown to provide support for the nurse to work in an increasingly advanced and autonomous role. Therefore, the theme of mentoring the practice unit becomes an important concept relating to the nurse-led management of cardiovascular disease.

Mentoring from outside of the profession or work environment was acknowledged to provide support to both the nurses, general practitioners as well as the practices involved in a New Zealand pilot programme (Horsburugh et al., 2008b) and was delivered and supported by academic experts. It is well represented in the literature that nurses have been provided with additional training to manage these roles (Horsburugh et al., 2008; McLoughney et al, 2007; Steptoe et al, 2001), therefore it could be acknowledged that mentorship would also assist nurses making the transition into the autonomous and extended role, as described in the included studies.

A successful mentoring or precepting relationship promotes academia, practice development and extension and when mentoring occurs inter-professionally, produces an environment that supports collaboration and nursing management of chronic disease. Indeed, Horsburugh et al. (2008) consider this as a pivotal form of supervision for the entire practice team, as evidenced

in this review. What was not evident within the literature was the depth of relationships that developed and how this form of professional supervision impacted on the quality of nurse-led cardiovascular disease management.

4.2.4 Collaboration

Nursing collaboration inter-professionally and intra-professionally was discerned to be a common pattern across the included literature, and is considered an intrinsic aspect of advanced nursing (MoH, 2002). The dynamics of a successful partnership between health professionals does not support leadership based on hierarchy, but requires teamwork and shared problem solving with the practice team reporting a positive experience that had enhanced communication (Murchie et al., 2005; McPherson et al., 2002). In addition, Horsburugh et al. (2008a) describe the importance of encouraging this team environment with the embracing of the 'action-orientated approach' (p.177), and other literature acknowledges the positive impact felt inter-professionally, with enhanced communication and improved patient outcomes (Murchie et al., 2005).

The literature shows collaboration occurring in several forms when nurses manage cardiovascular disease. Firstly, collaboration and partnership was shown to improve patient outcomes when primary and secondary care worked together, bridging gaps of care with high-risk individuals (Mainie et al., 2005). Inter-professional collaboration is seen with the development of treatment protocols and algorithms (McPherson et al., 2002), and of supported devolution of care from medicine to nursing, where nurses assume responsibility of prescribing with consent and support of the physician (Allen et al., 2002). Furthermore, McHugh et al. (2008) describe a successful model of intra-professional collaboration, where nurse-led shared care occurred between a specialist cardiac liaison nurse and a general practice nurse. This nursing partnership demonstrated effective improvement in risk factors,

general health status of participants and reported that there was improved coordination of existing services, improved collaboration, and development of evidence based guidelines (McHugh et al., 2008). Additionally, positive outcomes were also noted in a study where nurses worked in the role of a case manager along side medical specialists as well as general practitioners (Allen et al., 2002). Case management resulted in patients receiving treatment that combined the best of medical and nursing management with regular input from all clinicians, and produced significantly positive outcomes for patients receiving the integrative model of care.

Nurses may work as members of practice groups or multi-specialty groups in large health systems (Mainie et al., 2005), referring to specialists (Khunti et al., 2008) or other health care providers such as pharmacists or physiotherapists. The nurses' instituted referral of patients with presenting symptoms indicative of cardiovascular disease for the appropriate assessment and management, resulting in definitive diagnosis, rationalising of treatment plans that lead to relieved patient distress and outcomes (Khunti et al., 2008).

When collaboration amongst health professionals is absent, nurses report feeling alone and clinics are negatively impacted, and may eventually cease to exist (Murchie et al., 2005). Perhaps most concerning is the negative impact that a lack of professional dialogue can have on patient outcomes. It has been suggested that medical professionals who are feeling threatened by the nurses expanded practice may be reluctant to modify therapy even when indicated (New et al., 2004). As a result, patients are left confused and receive inadequate disease management, with the practice nurse and GP developing a strained and unprofessional relationship.

Collaborating with and referring to other health providers is a matter of good professional practice and, as already noted, is considered a core competency for advanced nursing practice in New Zealand (NCNZ, 2008). The literature shows that collaboration provides a process where nurses can work independently and interdependently within their scopes of practice, the literature conclusively supports the benefits to patient outcomes when this process occurs. In conclusion, the literature has described the importance of collaboration within and between professions to allow nurses to successfully manage cardiovascular disease in the primary care setting.

4.2.5 Perception of extended nursing roles

It is documented and expected that nurses experience the positive effect of working in an extended role, and report increased job satisfaction, increased confidence and skills (Horsburugh et al., 2008a). Peer perception of the role was not formally assessed within the literature, there is however implied support for the role evident as ongoing referral and utilisation of the nurse-led service by physicians (McPherson et al., 2002). Positive perception of the role was not always the case, with Murchie (2005) reporting that some nurses felt ill-prepared due to a lack of formal initial and follow-up training and support. The potential for isolation and a lack of support is apparent when considering implementing a primary care programme, and is recognised by Horsburugh et al. (2008a) who discuss the importance of planning the roles, providing clinical and professional support. Undoubtedly, negative role perception may occur where poor role performance is due to a lack of opportunity to access relevant and ongoing education (Horsburugh et al., 2008a), and is particularly evident when collaboration is absent. Other negating factors may include financial factors and time constraints (Murchie et al., 2005).

In conclusion, the literature suggests that nurses require appropriate preparation and support in order to provide nurse-led management of cardiovascular risk factors. A detailed knowledge of disease process and management strategies is necessary, along with professional support from managers, other nurses and physicians in the form of mentoring and collaborative relationships, all being requirements for an environment that empower nurses and supports nurse-led clinics.

4.3 Nursing management of cardiovascular disease

Every study in this review evidenced nurses providing education to patients for the primary or secondary prevention of cardiovascular disease. Patient education centred on modifying factors that were likely to contribute to cardiovascular disease, including smoking cessation and individualised advice about diet, exercise and weight (McLoughney et al., 2007; McPherson et al., 2002; McHugh et al, 2001; Woodward et al., 2006). None of the included studies differentiated between lifestyle advice only, and lifestyle advice in combination with pharmacological management. The amount of time spent providing education varied from brief intervention (Naslindh-Ylispangar et al., 2008) to the more intensive Stages of Change (Hilton et al., 1999; Steptoe et al.; 1999; Steptoe et al., 2001; Wood et al., 2008). Other than the Stages of Change- Transtheoretical model, there was no documentation of any other health promotion philosophy being utilised by the intervention nurses. The use of the Stages of Change model in promotion of health was described in several research studies included in this review (McHugh et al, 2001; Hilton et al, 1999; Steptoe et al, 1999; Steptoe et al, 2001; Wood et al., 2008).

4.3.1 Health education utilising the Stages of Change- Transtheoretical model

Encouraging smoking cessation, dietary fat reduction and increasing exercise are considered the significant lifestyle modifications required for cardiovascular disease management. It is widely recognised that people are at different stages when contemplating altering identified hazardous lifestyle behaviour. A model that describes this concept particularly well is the 'Stages of Change'- transtheoretical model, where the concept is assessing a person's willingness to change personal behaviour. The model postulates that individuals can be allocated to different stages of readiness to change (from pre-contemplation, to contemplation, preparation, action and maintenance of successful change) and that the baseline stage is a predictor of behaviour change (Steptoe et al., 2001). Naslindh-Ylispangar (2008) use the 'stages of change' to explain the lack of treatment effect even though the concept did not appear to be formally included in their research design.

The 'Stages of Change' model can be utilised as an integral step when providing healthy lifestyle education. Utilising the 'Stages of Change' philosophy, the nurse determined the patient's perceived stage or readiness to change, and used varying behaviour modification techniques commonly used in patient education (Steptoe et al., 2001). The techniques included goal identification and setting, self-monitoring and attitude change. They were shown to have a favourable result on uptake of healthy modifications to lifestyle through movement of patients from baseline stage to achievement of target behavioural state, empowering the patient to move on to self-care.

In conclusion, a model utilised within the literature to assist patients to modify risky lifestyle behaviour was the Stages of Change-transtheoretical model, which states that individuals require varying levels of behaviour intervention dependant on their readiness to accept

behavioural change. The following subtheme discusses the concept of patient self-management to assist with cardiovascular disease management.

4.3.2 Patient self-management

The theme of supporting patients to make lifestyle changes was discerned as a common concept across the literature. Lifestyle modification is acknowledged as an integral facet of cardiovascular disease management, with the concept of empowering patients to self-manage through increasing disease knowledge and goal setting, evident in varying degrees through the literature (Family Heart Study Group, 1994; Wonderling et al., 1996; Wood et al., 1994).

Strategies utilised to encourage self-management included patient booklet use (Naslindh-Ylispangar et al, 2008) incorporating the documentation of personally negotiated lifestyle changes in relationship to identified risk factors (Family Heart Study Group, 1994; Wonderling et al., 1996; Wood et al., 1994). Within the New Zealand primary care setting, the Care Plus programme facilitates a health needs assessment and individual care plan development that sets realistic and achievable health and quality of life related goals, with regular follow up (MoH, 2006) and is similar to the previously described self-management program (Family Heart Study, 1994). It is considered effective in chronic disease management due to increased patient understanding, and provides ongoing support for lifestyle changes. Funding is directed at the General Practices through the PHO's, providing a mechanism of revenue that nurses can source for nurse-led chronic disease management. External validation of the MoH 'Care Plus' program occurred in 2006, the findings concluding that the model was largely meeting the objectives of long-term condition management for which it was designed, providing the required support to assist with lifestyle change (MoH, 2006).

The relative success of a patient self-management strategy may in part lie with providing client centred counselling, recognising the impact of the family environment on modifying risky conduct, rather than simply giving advice (Wood et al., 1994). Providing support to assist change management requires a holistic assessment and establishment of readiness for transition. The inclusion of the family unit in the education program creates a family centered approach to provide a holistic and supportive environment to aid successful change management (Wood et al., 1994; Wood et al., 1994; Wonderling et al., 1996) and requires the involvement of the partners. It is recognized that a family approach is appropriate because married couples show concordance for lifestyle and concordance for change and those making the greatest changes had partners making similar changes (Wood et al., 2008). The EUROACTION study further developed this family centered approach by involving both eligible patients, their partners, and including group workshops into the structure (Wood et al., 2008). Group sessions were perceived to reduce educator workload and provide another means of support for the patient.

4.3.3 Care and empathy for the patient

Nurse-led management of chronic disease is underpinned by an intention to improve health outcomes, reducing morbidity and mortality of a population using evidence-based medicine and innovative models of care delivery. The theme of patient care is intrinsic to the development of these clinics. Murchie et al (2005) reported that the health professionals (medical and nursing) involved in the nurse-led cardiovascular clinics believed that the patients were satisfied and empowered by the clinics, this being a motivating factor in continuing the clinics in the long term. Nurses reported enjoying the increased time with patients and the ensuing development of the enhanced relationships.

The effective counselling of patients on modifying hazardous lifestyle habits requires empathy, a willingness to share information and the academic background to support the education. Woodward et al. (2005) articulate that patients appeared to benefit no matter what the intervention, patient evaluation emphasized the importance of continuity of care and the human aspect of familiarity, aspects of the clinics that patients found reassuring. Patients described being empowered by the nurse-led clinics (Campbell et al., 2005) and reflected by an improvement in SF-30 scores (Khunti et al., 2008; Page et al., 2005). This suggested the importance of education and support that is obtained from the nursing intervention. The ideal result of regular interactions between health care provider and patient is the development of a professional relationship, where patients are evidenced to be empowered (Campbell et al., 2005) and participate in their care, thereby demonstrating a generalised improvement in their physical and mental well-being.

4.3.4 Participation in care

New Zealand literature states that those at higher risk often fail to attend for lifestyle assessment or accept ongoing management and follow-up of chronic disease NZGG, 2003; MoH, 2001). Ethnic minorities and the impoverished, smokers and those with severe risk factors are demonstrated to not access or accept medical management readily (MoH, 2001). The reviewed literature showed that the asymptomatic, middle-aged male was another group within the population whom were more likely to remain ambivalent or not participate in lifestyle modification. Naslindh-Ylispangar et al. (2008) suggested that this group of men believed they didn't have time to participate and avoided any interactions with health professionals. This theme was also suggested in the OXCHECK study (Imperial Cancer Research Fund OXCHECK Study Group, 1995; Langham et al., 1996; Wonderling et al, 1996) where men, considered to have a higher absolute risk than women, showed less change than women. This was considered to be due their lack of willingness to follow up with health

professionals. Therefore, it is acknowledged that by recognizing the high-risk population groups and reducing barriers through including their significant others, the modification of lifestyle is increasingly likely to occur due to improved efficacy of encounters and the increased attendance at follow up appointments.

4.3.5 Intervention intensity[5]

The theme of the quality and frequency of nurse-led contact formed an important concept that related to clinical validity, cost-effectiveness, and perception of staff and patients involved in the nurse-led interventions.

It was indicated within the literature that increased frequency of patient contact resulted in more patients reaching their lifestyle goals. Research data that supported this concept was evidenced by two projects that employed differing education intensities. In contrast to the high intensity, family orientated programme designed in the British Family Heart study, Naslinder-Ylispangar et al. (2008) suggest that the lack of ongoing effect was due to the brief nature of the intervention they provided and the lack of follow up offered. Their findings demonstrated a significant improvement of modifiable risk factors at the first follow up but these factors had tended to revert to baseline at the follow-up. In contrast, Maine et al (2005) state that the intensity of the intervention is directly related to the success in meeting clinical targets.

Intervention intensity should not be prescriptive, tailoring the content and timing of patient education sessions must be individualized to maximize effectiveness of the education and cost efficiency, assessing the clients motivational readiness to change (Naslindh-Ylispangar et al.,

[5] The term 'intensity' is being used to mean the quality and frequency of the nurse-led patient interaction

2008). Financial and infrastructure constraints require that health care providers be adept at providing appropriately powered interventions, with the development and following of research protocols supporting the nurse to individualize follow-up according to risk factors (Steptoe et al., 2001; NZGG, 2003). Accordingly, it was shown in one study that nurses were mindful of resources by recalling patients dependent on need and were able to make significant improvements in modifying risk factors (Mainie et al., 2005). It is also understood that certain lifestyle indicators are more easily met than others, and in the OXCHECK study the intervention intensity appeared to have little impact on smoking cessation rates, however significant changes were recognised with dietary habits. In addition, Khunti et al. (2008) theorized that successful interventions could be due to any one of several factors, proposing that there is difficulty determining what produced the greatest effect. Despite what Khunti et al (2008) postulated, the research findings suggest that an ongoing programme to support and maintain behaviour modification has greater success in reaching goals (Mainie et al., 2005), and that low intensity programmes have a relatively short effect.

4.3.6 Methodological management

The principles of structured methodological management is considered an essential aspect to the successful supervision of cardiovascular disease, allowing the identification, management and timely recall using evidence based practice recommendations (Moher et al., 2001; Naslindh-Ylispangar et al., 2008). Clinical algorithms used within the included literature provided a method or process by which the nurse may manage patient care, and optimise medications and clinical risk factors designed on current best practice guidelines (McPherson et al., 2002; Woodward et al., 2006). Open clinical algorithms provided the nurse with the ability to individualise treatment choices within an agreed protocol, consequently providing more flexibility (Woodward et al., 2005; Woodward et al., 2006) and evidencing effective case management and improved patient adherence (Allen et al, 2001).

In addition to algorithms, it is acknowledged that high quality care and management of chronic disease occurs with a planned and systematic recall system that increases the probability of planned follow up (Imperial Cancer Research Fund OXCHECK Study Group, 1995; Moher et al., 2006). Indeed, protocols may be described as an agreement of treatment developed between medical and nursing clinicians, characterised by an obligation to manage patients in a pre-determined manner. The use of strict protocols was not restricted to nurse-led delivery of pharmacological management, but also depicted in research that used guidelines for nurse-led lifestyle management and follow-up care (Imperial Cancer Research Fund OXCHECK Study Group, 1995; Woodward et al., 2005; Woodward et al., 2006). In addition, effective recall required the appropriate infrastructure within the practices, including computerised practice management systems and decision support, and certainly congruous staffing ratios (Horsburugh et al., 2008a; Horsburugh et al., 2008b; Murchie, 2005) that support the concept of the nurse-led management of cardiovascular disease. Furthermore, the recall and management of a patients cardiovascular risk factors should reflect their absolute risk, this being recognised as an appropriate use of resources, and is an inherent principle of the NZGG (2003) recommendations for the management of cardiovascular disease.

Therefore, research findings support that healthcare professionals recognise the importance of regular patient contact and the positive impact this has on patient outcomes, including patient and nurse perceptions. Nurses show the ability to manage time spent educating and recalling patients according to protocols and tailoring this according to recognised need. The author considers this an essential requirement of appropriate and efficient cardiovascular management.

4.3.7 Cost-effectiveness

Cost versus the perceived success of nurse-led intervention outcomes was discussed in two included studies (Wonderling et al., 1996). However, the relationship between the expense of

having a nurse-led clinic and the effect on the success of these clinics was evident within other included literature (Horsburugh et al. 2008a; Horsburugh et al, 2008b).

From the reviewed literature, it could be postulated that the cost effectiveness of cardiovascular disease management is directly dependant on two principle factors. Firstly, Wonderling et al. (1996) believed that validity of cost is determined by the "assumed duration of risk reduction" (p.1274) with the resultant reduction in health dollar expense occurring when the assumed risk remains decreased in the long term. Secondly, another cost determinant was recognised as intervention intensity. The literature recognises that the higher the intervention intensity, the greater the cost, this was displayed in a cost analysis between the OXCHECK and British Family Heart studies (Wonderling et al., 1996) where funding resources were consumed by the nurse-led health checks.

The increased demands on the health budget for staffing and infrastructure to support the provision of nurse-led interventions requires dedicated funding (Horsburugh et al, 2008a). Furthermore, Mainie et al. (2005) reflected on the extra resources required to build capacity and support the secondary prevention clinic, recognising the long-term cost effectiveness of such a project that targeted the 'high-risk' individuals. In contrast, an American study by McPherson et al (2002) describes a management structure that failed to recognise the long-term benefits, discontinuing a service when the nurse was unable to recoup her wages through patient fees. The dissertation author recognises differences internationally in funding of primary health care provision, with the research conducted by McPherson et al. (2002) demonstrating the impact of short-term financial profitability on the management of chronic disease. Within New Zealand, the Ministry of Health has developed funding streams to support nurse-led cardiovascular disease management, which include 'Care Plus' and 'Services to Improve Access', two examples of dedicated PHO delivered support.

Accordingly, those that are at greatest need are often more difficult to access (NZGG, 2003), therefore, dedicated funding resources are obligated to establish innovative methods of care, with appropriately allocated resources that reflect the unmet need (NZGG, 2003).

It is recognised that the population is aging with prediction that chronic diseases will mobilise a large proportion of the health dollar in the future. The literature suggests that costs of nurse-led health care could possibly have escalated with the increased number of visits but this may have been off-set by reduced hospital admissions and cost of care in the long term (Page et al., 2005; Joanna Briggs Institute, 2006). Conceivably, there will be an increase in pharmacological expense around increased prescribing, laboratory expenditure and interventions, along with greater patient medication compliance and treatment expectations associated with enhanced disease knowledge of the patient. Broader costs may relate to the social impact due to the morbidity and mortality of cardiovascular disease, and may include financial support through benefits, as well as lost productivity (Langham et al., 1996). Therefore, although these concepts are considered for discussion, the author recognises that they are beyond the limits of this review.

4.4 Summary

Chapter Four has further synthesised the included literature and developed the themes that surround the research questions of nurse-led management of cardiovascular disease. The findings state that the nurse-led management of cardiovascular disease is as effective, if not better than physician-led care (Page et al., 2005; Joanna Briggs Institute, 2006), and this chapter has explored the literature and discussed the themes that have emerged regarding the preparation and support of the nurse for the role, the strategies utilised in the nursing role and

the cost effectiveness of a clinic. These themes are further discussed in Chapter Five, providing the framework for the recommendations at the conclusion of the review.

CHAPTER 5:

REVIEW DISCUSSION

5.1 Introduction

In this chapter concepts and themes elicited from the reviewed literature are drawn together in a discussion and related to the current management of nurse-led cardiovascular disease in the New Zealand primary health care setting. The extrapolation of themes allows the reviewer to develop recommendations for preparation of the nurse, as well as discuss the broader concepts surrounding infrastructure and clinical support that have been shown to either impede or sustain an extended nursing role. Additional literature is integrated into the chapter critique, increasing the strength of thematic analysis and discourse. Finally, the review concludes with recommendations for the nurse-led management of cardiovascular disease in the New Zealand primary health setting, concluding with suggestions for further research.

5.2 Discussion

This section of the review will summarise and discuss the literature review findings pertaining to the research questions posed (see aim, Chapter Two) and then extrapolated in Chapter Four. The themes that recur throughout the literature are considered to be fundamental in the development of nurse-led cardiovascular disease clinics. The discussion is augmented with supporting evidence from other research findings.

As discussed in Chapter One, cardiovascular disease is the leading cause of death and premature mortality in New Zealand, with the burden of disease more prevalent within the socially deprived and some ethnic groups (Bramley et al., 2004; NZGG, 2003). This review has identified the factors that impact on the success of preventative programmes. These may have been directly related to the patient, health care provider, or local and national government policies where planning, funding and legislation all influence the development and integration of preventive health strategies. Furthermore, it is recognised that a critical mass of nursing staff is required to provide intensive nursing management. Dedicated funding streams, policy development and legislative requirements provide the background for innovative nursing management, as described within the New Zealand Health Strategy (MoH, 2000) and ensuing key health documents, with international trends parallelling what has been experienced in New Zealand (Brown & Psarou, 2007).

In this literature review, the characteristics of a successful nurse-led clinic cardiovascular management have been elicited, and factors that support or impede the development of such a model of health care delivery have been discussed. The included literature indicated that nurse-led programmes encouraged the adoption of healthy lifestyles, risk factor modification and medication compliance, generally leading to positive results in both the short and long term. Similar findings have been reported in other reviews (Joanna Briggs Institute, 2006; Fahey & Schroeder, 2004). It is recognised that the greatest effect occurs when there was intensive management and systematic follow-up, with the greatest cardiovascular risk reduction having occurred in those patients with the highest risk (Clark, 2006), and in those requiring secondary prevention (NZGG, 2003). In fact, a review by Oakeshott, Kerry, Austin & Cappuccio (as cited in Fahey & Schroeder, 2004) stated that in the main nurses rigorously adhere to national guidelines, leading to improved prescribing, better treatment adherence and improved follow-up. However, in spite of evidence that supports the management of

modifiable risk factors, many patients continue to receive inferior treatment (Joss & Lindsay, 2003). Recognising current deficiencies in health care, the Ministry of Health is changing focus and necessitating DHBs and PHOs rationalise service provision to improve performance and sustainability (MoH, 2009).

The delivery of health services in New Zealand is currently under review (MoH, 2009), with the likelihood that there will be rationalisation of services and the infrastructure that support them. Consequently, there have been recent developments in Otago and Southland, with the anticipated formation of one regionalised DHB and PHO, absorbing the nine Otago and Southland PHOs that currently exist. By sharing back office functions and clinical expertise it is believed that the continued delivery of regional clinical services will be ensured (Southern Alliance, 2009). How this regionalisation effects the provision of health care in small communities has been debated intensely, creating divisions amongst health care providers and management (Southland District Health Board, 2009). As a health care provider in a small community, the author anticipates the effects of ongoing change on the provision of effective primary health care, recognising that the answer to this question goes well beyond the limits of this review. What is apparent however are the critical factors that support a nurse-led clinic, including organisational and clinical issues.

The suggestion is drawn from the literature that successful clinics occur when key organisational factors were addressed, along with the establishment of collaborative teams that support infrastructure change and mobilise resources within practice environments. Fundamental requirements comprised practice infrastructure that included computerised practice management systems and decision support tools, along with dedicated nursing time and adequate consultation rooms (Horsburugh et al, 2008a; Horsburugh et al., 2008b; Halcomb & Davidson, 2007). Furthermore, Poulton and West (1999) depict what comprises

effective clinical teams, stating they require clearly defined objectives, team participation, an emphasis on providing a quality and contemporary service. On the other hand, professional barriers and perception of inequalities of status, along with differing funding streams and management lines are accepted as negative determinants of teamwork (Poulton & West, 1999). These factors have all been referenced to some degree within the reviewed literature.

It is conceivable to state that collaboration as a conceptual framework is the primary intrinsic factor that determines clinic outcomes. Correspondingly, a definition by Way, Jones and Busing (2000) augments this finding by stating that:

> ....collaboration is a way of working, organizing, and operating within a practice group or network in a manner that effectively utilizes the provider resources to deliver comprehensive primary healthcare in a cost-efficient manner to best meet the needs of a specific population (p. 3).

Within the literature collaboration occurred in many forms and is illustrated in the following examples. Collaboration was noted to occur between health professionals as well as between the health providers. Similarly, collaboration was shown to be an important factor within relationships between the nurse, patient and family unit. At a policy and government level, a collaborative philosophy is a requirement, as described in the development and implementation of health strategies (MoH, 2000; MoH, 2002). More recently, Stephen McKernan (Director-General of Health) articulated this principle, stating that "through co-operation, sharing best practice and striving always to do the best" (MoH, 2009, p. iv), health service delivery will be improved. Therefore it behoves all health professionals to build effective interprofessional networks.

It is indicated from the review that inter-professional collaboration and mutually supportive relationships between clinicians who shared common treatment goals is a prerequisite for successful nurse-led cardiovascular disease management. In contrast, confusion, conflict and poor outcomes may occur when the GP and nurse do not share management goals (New et al., 2004). A Canadian discussion paper on the development of collaboration in primary care states that building a culture of collaborative practice within an organization is believed to occur when essential elements are recognised and fostered, and when the practice population remains at the centre of the decision making (Way, Jones & Busing, 2000).

The elements of collaboration are not foreign to health professionals but are seldom seen in concordance. They include both independent and shared accountability for practice; knowledge of each others roles; the ability to communicate effectively, confidently, assertively and respectfully; have respect and the ability to acknowledge other team members; autonomy of practice; and amongst the team, mutual trust and respect (Way, Jones & Busing, 2000). The list represents the ideal of any equal relationship, yet in contrast Horsburugh, Lamdin & Williamson (2001) recognise the reality of "interprofessional prejudices" and "stereotypical attitudes" that impede teamwork in health professions (p.882). These findings evolved from research developed to assess the attitudes of health professionals to collaborative learning, and reinforce findings regarding barriers to successful nurse-led clinics described previously.

The author recognises there are several determinants of collaboration, some of which go beyond the limits of this review. It could be recognised that fostering a collaborative culture from the inception of a health professionals career will encourage the adoption of those values in practice. Including interdisciplinary education occurring at pre-registration levels as recommended by Halcomb et al. (2007). Therefore, one may consider that partial

responsibility falls on the professional governing councils and teaching institutions to 'indoctrinate' the philosophy at both under-graduate and post-graduate levels.

In Chapter One, concerns surrounding nurses working with inadequate support was introduced. Such issues must be considered when developing the direction of health care provision for the future. Since 2000, New Zealand Ministry of Health strategists have articulated frequently that the provision of health care should be equal for both urban and rural populations, requiring innovative models of care in order to achieve these ideals. Nursing scopes[6] of practice have evolved with education and opportunities for nurses to take on new and extended practice roles, mirroring nursing development in other countries (Laurent et al., 2004). In reality, legislation has been slow to follow in New Zealand. Therefore, as regulators of nursing practice, it is appropriate that the Nursing Council of New Zealand are currently considering the implications of nurses working in these extended roles, recognising the need for a change of legislative requirements that surround this (NCNZ, 2009).

The allocation of practice or PHO funding for the additional expenses incurred with running a nurse-led cardiovascular management programme, required specification so that financial barriers would be removed. It is recognised that dedicated funding is necessary to maintain a clinic (Berra, Houston Miller & Fair, 2006), with the unfortunate reality that short term cost effectiveness may be more influential on clinic longevity than positive outcome measures for patients (McPherson et al, 2002). The New Zealand Health Strategy (MoH, 2001) focuses on the implementation of population based health promotion, with capitated funding providing the financial lever to implement programmes such as for cardiovascular disease prevention

[6] The use of 'scope' in this context does not designate the legal entity as described by the Health Practitioners Competency Act (2003) and Nursing Council of New Zealand, but describes the breadth of clinical roles nurses undertake in response to population needs.

and ongoing management. Unfortunately, even with the theoretical acceptance of nurses having more nursing autonomy, accountability and professional recognition, this does not always occur due to funding constraints and a lack of nurses in strategic positions (Docherty, Sheridan & Kenealy, 2008).

The preparation and appropriate ongoing support of the RN in extended roles is necessary, and the literature suggesting that a clinical nurse specialist with an advanced knowledge in the pathophysiology and pharmacotherapy of cardiovascular disease is the most effective nursing provider. In addition, Berra et al. (2006) suggest that nurses are ideally suited to take the challenge due to knowledge and skills learnt while training, with patients experiencing increased satisfaction following a nurse consultation for chronic disease (Cheater & Redsell, 2006). Although the included literature predominantly describes the specialist nurse in this role, an NP was utilised in one study (Allen et al., 2002) with notably positive results. This supported the previously recognised theme that clinical outcomes were improved when assessment and management was provided by a nurse with advanced clinical skills, and in fact, a systematic review on nurse-general practitioner substitution recognised that good health outcomes occurred for patients with appropriately trained nurses (Laurent et al., 2008). Nonetheless, a recent Australian paper states that in reality, a majority of nurses working in primary health do not have undergraduate degrees or higher qualifications, and require enhancement of their theoretical knowledge in order to provide appropriate education and management of cardiovascular disease (Halcomb et al., 2007).

Counselling for behavioural change to manage modifiable cardiovascular risk factors is imperative along with the recognition that cardiovascular disease is a chronic disease that requires lifelong management (NZGG, 2003). The use of the 'Stages of Change' model to assist in the management of cardiovascular risk factors is reported to be effective and has

allowed nurses to provide the appropriate level of information-giving and support dependent on the identified 'Stage of Change'. Other management strategies utilised included assisting patients to modify lifestyle through negotiated care plans, and within a supportive environment of family or peers. A family centred approach was shown to increase patient compliance with the additional advantage of including a wider audience and affecting the whole family. Nurses have readily adopted this philosophy as they are recognised to employ more explanations and observe patient opinions when consulting and planning care (Cheater & Redsell, 2006). Utilising a patient centred care model in the management of cardiovascular disease supports how patients wish to be managed (de Lusignan, Wells & Russell, 2003) and increases treatment compliance.

The empowerment of patients to be actively involved in self-management increased their disease insight, reduced intervention distress and improved patient outcomes. Nurses reduce management anxiety by engaging their clients (MacIntosh & McCormack, 2001). This is recognised as an important aspect of creating client compliance and improving patient management, along with involvement of the family unit or peer group for support. Through the sharing of information, the nurse enabled the patient to participate in their health care (MacIntosh & McCormack, 2001), creating a partnership that supported the philosophy of family centred nursing. The principles of family nursing recognise that the structure and organization of the family unit are central to the health of the individual (Whyte, 1997). In reality, it is expected that the family unit take a more active role in the health care of their members, assessing and managing individual members needs (Allen & Petr, 1998). Accordingly, utilising nurses who have a holistic knowledge of the patient assists the process of sharing appropriate information, considerably improving the likelihood of patient commitment to care through their participation and involvement in planning for ongoing

disease management (MacIntosh & McCormack, 2001; Stein-Parbury, 2003; Whitehead, 2009).

Compliance and continued motivation on the part of the patient are required when instigating any long-term lifestyle interventions. As Murchie et al. (2003) found, most sustainable lifestyle interventions provided over a prolonged period were evident in successful nurse-led clinics, and were maintained in the longer term. Sustained intervention intensity for lifestyle change required ongoing nursing intervention, and longer exposure to clinics had been associated with improved secondary prevention (Murchie et al., 2003). Changing patient behaviour in the long term requires commitment (Clare & Sandys, 2002) and in contrast, if patient compliance is missing, any amount of individualised support will have little effect on outcomes (Clark, 2006). Therefore, the ability of the patient to collaborate (MacIntosh & McCormack, 2001) and attend follow up care appeared to be integral in maintaining patient behaviour changes in the long term and optimising cardiovascular risk prevention. This indicated that a successful programme would require ongoing continuous high-intensity interventions for an extended period of time, the on-going effectiveness related to program design and intensity.

This section has discussed the determinants of a successful nurse-led clinic. Describing the themes extrapolated from the reviewed literature, the author has validated these by utilising additional literature. In the next section, the review considers the association of the extrapolated concepts on the provision of primary health care.

5.3 Implications for practice

It is evident that the implementation of nurse-led clinics for cardiovascular disease needs to be structured and planned. Nurses must have a good understanding of the theories and principles of cardiovascular risk management, including the pharmacological management of the multiple risk factors. Additionally, it is acknowledged that a successful programme required complete buy-in from patients as well as well as the practice team, but above all, the ongoing support of medical colleagues and management. In this section some of the specific implications for practice will be identified and practice recommendations will be made.

The author believes that much can be learnt from the Mornington PHO programme that supported the development of nurse-led clinics. The reviewer recognises that the Mornington PHO experience reflected several themes that were extrapolated from this review and values the importance of their experience in developing practice recommendations for this review. Firstly, the development and fostering of a population-wide directive requires leadership and shared vision across the business, incorporating financial, medicine and nursing leaders. This approach allows the channelling of funds to support infrastructure, wages and administration costs incurred. Secondly, the appointment of strategic individuals with proven leadership qualities, a strong interest in cardiovascular disease management and a primary health philosophy that is in concordance with these ideals is fundamental to the success of a nurse-led clinic. Moreover, involving the entire team in regular meetings to anticipate or solve actual problems, maintains enthusiasm for clinic success and establishes collaborative relationships within the team (Horsburugh et al, 2008a; Horsburgh et al., 2008b). Utilising nurses with an understanding of the theories of adult learning, and knowledge of the community and population within it supports the process of patient engagement, and in this context, preparedness to manage cardiovascular risk factors.

Establishing a nursing team capable of practising at this extended level requires organization and educational consideration. Planning for educational requirements in association with local PHO and DHB professional nursing advisers and education providers assists in meeting individual nurses needs, and cooperates in establishing the previously described population-wide approach. From this review, it is acknowledged that nurses require additional education and support in the following:

- knowledge of the pathophysiology and management of cardiovascular disease;
- principles of smoking cessation;
- access to patient education tools;
- computerised decision support tools;
- use of EBM treatment protocols;
- understanding of the theories of *Family Centred Nursing*;
- use of motivational interviewing and the *Stages of Change Model;*
- for those nurses initiating or titrating pharmacological management, completion of an approved Pharmacology paper;
- access to appropriate mentoring and professional clinical supervision.

Nursing management must foster a work environment that supports individual nurses growth, with reducing barriers for nurses to attend relevant educational courses. In recognition that education sessions often occur during personal time, it is fair to financially compensate nurses.

5.4 Review recommendations

a. Nurse-led interventions should be provided by registered nurses with an in-depth knowledge of chronic disease management, of the pathophysiology of cardiovascular disease, and the evidence that supports the appropriate management of the disease process.

b. Nurses are supported into autonomous roles by fostering intersectoral collaboration.

c. The level of nursing management and intervention will be related to the patient's absolute cardiovascular risk, and follow current best-practice guidelines.

d. The use of evidence based treatment algorithms and protocols by suitably prepared nurses, in the combined lifestyle and pharmacological management of risk factors.

e. Practice management systems will support appropriate care through patient identification and recall, data accumulation and export, and the use of decision support tools.

f. The development of a Clinical Nurse Specialist role to provide leadership and support to primary care nurses within the PHO environment.

5.5 Review limitations

The limitations of this review must be acknowledged. The search strategy was designed to be broad so as to detect any relevant research, but this resulted in a large amount of literature that required exclusion. The author acknowledges the possibility of publication bias as the search strategy excluded all research not published in English.

It is recognised that several studies had multiple forms of intervention which disallowed specifying which intervention produced the greatest outcome effects. A selection of studies (large randomised controlled trials) produced several articles that provided evidence for this review. The author recognises that any methodological flaws in these large trials may have affected results that are reported from those clusters of research articles. There was little detail within much of the included research on nurse training, and the specific details of the nursing interventions provided.

5.6 Conclusion

In summary, this literature review has elicited the characteristics of a successful nurse-led clinic cardiovascular clinic, and discussed factors that support or impede the development of such a model of health care delivery. The included literature indicated that nurse-led programmes encouraged the adoption of a healthy lifestyle, risk factor modification and medication compliance, generally having positive results in both the short and long term. The greatest effect was shown to occur when there was intensive management and systematic follow-up, and suggested that the greatest cardiovascular risk reduction occurred in those with the highest risk, and in those requiring secondary prevention.

In support of nurse-led management of cardiovascular disease, the results of this review show that a successful population based nurse-led cardiovascular program requires the nurse to have undergone appropriate preparation for the role, and receive ongoing support and collaboration from management and peers. In addition, the nurse must utilise ongoing structured clinical patient management in the form of agreed treatment protocols or algorithms, with the extended role of initiating or titrating medication, as educational qualifications and GP support will allow. The included literature supports the potential benefits of nurse-led interventions for patients, and evidences that the most improved outcomes occur when specialised nurses are enabled and supported in these roles, utilising structured clinical management and a family centred approach. Therefore, the challenge now is for health professionals to implement an effective programme that envelops the entire PHO sector based on the findings of evidence-based literature, and for the management and providers of primary health care and their enrolled population to fully embrace this model of preventive care in order to reduce the incidence and impact of cardiovascular disease in the community.

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APPENDIX A:

Cardiovascular Risk Factors

The standard risk factors are listed below, and are retrieved from the evidence-based best practice guideline *The Assessment and Management of Cardiovascular Disease* (New Zealand Guidelines Group, 2003)

a. **A personal history of cardiovascular disease**, as described in **2.2**

b. **Age-** considered a major risk factor, with the prevalence of cardiovascular disease increasing with age. 85% of coronary heart disease deaths occur's in those aged over 65 years.

c. **Sex-** the age specific mortality is 2 to 5 times higher for middle-aged men than women. The death rates from cerebrovascular disease is similar for men and women at the same age.

d. **Smoking status-** the risk of coronary heart disease in 2 to 3 times higher in smokers, the relationship between the amount smoked and cardiovascular disease being continuous.

e. **Lipids** -the higher the total cholesterol level the greater the cardiovascular risk. HDL-cholesterol is considered an independent predictor of cardiovascular risk. A low HDL increases cardiovascular risk but a high HDL does not necessarily imply low risk. A triglyceride level above 1.7mmol/L (fasting) is a predictor of cardiovascular risk.

f. **Blood pressure-** there is a constant linear relationship between relative cardiovascular risk and elevated blood pressure levels in the range of 155/70 to 170/100 .

g. **Diabetes-** there is a strong association between elevated blood glucose and the risk of cardiovascular disease with the suggestion that there is a constant linear relationship between HbA1c and cardiovascular risk.

Other well-established determinants of cardiovascular risk include:

a. **Atrial fibrillation-** the risk of stroke increases 5-fold.

b. **Obesity**- people with a body mass index (BMI) >30 have a 40-fold increased risk of developing diabetes and a 2 to 3-fold chance of coronary heart disease and stroke. Truncal obesity is a better predictor of coronary heart disease.

c. **Impaired carbohydrate metabolism**- impaired glucose tolerance is a significant risk factor in developing diabetes and cardiovascular disease.

d. **Metabolic syndrome**- a significant risk factor with a similar cardiovascular risk as a diabetic patient.

e. **Nutrition and dietary patterns**- a diet high in red meat, refined grains, sweets, deep-fried foods and high-fat dairy food.

f. **Physical inactivity**- regular physical activity is associated with a reduced cardiovascular risk. The more frequent and intense, the better the protection.

g. **Family history of premature cardiovascular disease**- the risk is approximately doubled if a first-degree relative has developed proven cardiovascular disease before the age of 55 years in men, and 65 years in women.

h. **Socio-economic position**- the cardiovascular disease risk is almost doubled for those people living in the lowest compared to the highest socio-economic rating.

i. **Depression, social isolation and social support**- there is an independent causal association between depression, social isolation and quality social support and the prognosis for coronary heart disease.

These risk factors align with the National Heart Foundation's cardiovascular risk tables based on The Framingham Heart Study. They form the basis for the outcome measures relating to the efficacy of nurse-led management of cardiovascular disease. The Framingham risk equations are currently recognised as the best tool for estimating cardiovascular risk in New Zealand (NZGG, 2003).

APPENDIX B:

Literature Review Protocol

Citations:
Authors:
Title:
Journal: Year: Vol: Iss: Pages:
Type of Study:
Location/Setting:

Key Concepts:
Concepts:
Intervention/Independent Variable:
Dependent Variable:
Controlled Variables:

Design type: Experiment Quasi-experiment Pre-experiment Non-experiment
Specific design:
Description of Intervention:
Longitudinal/prospective Cross-sectional No. of data entry points
Sample: Size:
Sampling Method:
Sample characteristics:

Data Sources:
Description of measures:

Data Quality:

Statistical Tests:
Findings:

Recommendations:

Strengths:

Weaknesses

APPENDIX C:

Stages of Change - Transtheoretical Model

The model was first conceptualised in the 1980's by Dr James Prochaska and his colleagues, in order to facilitate behavioural change of smoking cessation (Singer, 2007). Prochaska, Velicer, Rossi, Golstein, Marcus Rakowski, 1994, (as cited in Singer, 2007) state it is imperative for healthcare providers to understand and identify the stage an individual is in before a successful healthy behavioural change can occur and also recognise that individuals may move between stages several times before making permanent change. The model recognizes that behavioural change occurs through a series of five stages, and include:

a. precontemplation
b. contemplation
c. preparation
d. action
e. maintenance

In the first stage, *precontemplation*, an individual is not intending to make any behavioural change in the next six months. This may be because of lack of knowledge surrounding their harmful behaviour, it may be an informed decision, or due to feeling discouraged due to previous failed attempts. This stage may be identified due to an avoidance to discuss high-risk behaviours, or the individual appearing apathetic or resistant. Nurses should provide as much education as possible to explain the risky behaviour, but also should empower the individual by recognising a patient's own free choice.

The second stage is *contemplation* where the individual intends to alter an unhealthy behaviour within the next 6 months. It is theorised that the person is acutely aware of their unhealthy behaviour but is also aware of the unwanted consequences. This stage may take much time to work through, as the individual weighs the pros and cons. Nurses may assist in this stage by providing a lot of health promotion advice, reinforcing the benefits and encouraging the individual to explore the perceived barriers for change. Nurses may assist in this stage by maintaining and encouraging dialogue, educating re coping strategies and providing ongoing support.

Preparation, stage three, is when the individual is willing to take definitive action within the next thirty days. Prochaska states that people in this stage have typically formed a plan of action and have proactively started making alterations. Nurses may assist during this stage by encouraging and empowering patients to realise they have the power and ability to facilitate healthy change (Singer, 2007).

Action is when the individual has made specific changes to their lifestyle within the last six months. For a patient to have attained this stage, they must have passed a criterion where healthcare professionals agree is sufficient to reduce risk for disease. Nurses should emphasize attainable goals and recognise that the potential for relapse is high in the first six months after initiating change. They can support patients into the final stage by encouraging self-efficacy when confronting obstacles, assist with exploring feelings and reinforce the long-term benefits of the healthy behaviour.

Maintenance is the final stage, where people work to prevent relapse. In the maintenance stage, people are less likely to relapse as they become more confident with their healthy behaviour and start seeing the benefits such as weight loss, better mood, or improved

respiratory status. Nurses may assist by reinforcing the benefits, identify triggers and discuss strategies that will prevent relapse (Stringer, 2007).